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Public Safety / Field Surveillance Provincial Summary 2008

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Energy Resources Conservation Board

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Executive Summary

The Energy Resources Conservation Board (ERCB) is committed to ensuring that energy development in Alberta occurs in a manner that is efficient, in the public interest, and, above all, carried out in a way that is safe for Albertans and the environment. To help fulfill this commitment, the ERCB Public Safety/Field Surveillance (PS/FS) Branch has assembled a team of highly trained field inspectors who undertake thousands of inspections each year. The Community and Aboriginal Relations (CAR) team engages stakeholders about the ERCB, and Emergency Planning and Assessment staff ensure that requirements in *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry* are being met.

Operating out of nine ERCB Field Centres throughout Alberta, field staff inspect construction, operation, and abandonment activities at oil, gas, and in situ oil sands facilities (including pipelines, compressors, and processing plants). The ERCB is responsible for overseeing an inventory of more than 244 000 wells, 22 358 oil batteries and associated satellites, 797 gas plants, 14 764 gas batteries, 4613 compressor stations, and the 412 555 kilometre (km) pipeline network operated by energy companies in our province.

In addition, field staff respond to incidents, emergencies, and public complaints on a 24-hour basis.

Inspections and Enforcement

Total field inspections, which include well site inspections, increased to 18 667 in 2008 from 16 408 in 2007. The ERCB was able to increase the number of inspections due to several factors: a large increase in well site inspections, additional inspection staff, fewer well control incidents, which resulted in less time spent on the investigation of these events, and the inclusion of air monitoring inspections.

The compliance rate with High Risk requirements increased to 98% in 2008 from 97.5% in 2007, due in part to staff focusing on conducting operator awareness sessions across Alberta to increase industry's awareness and understanding of ERCB requirements.

Drilling and Servicing

Drilling activity decreased in 2008 compared to recent years. Despite this, more than 90 000 wells have been drilled in Alberta since 2004.

In 2008, 9 blowouts occurred during the drilling of 15 417 wells, compared to 14 in 2007, when 16 662 wells were drilled. This equates to 0.58 blowouts per 1000 wells drilled. Eight of these blowouts were freshwater artesian flows (one well had a sweet gas flow associated with the fresh water flow) and were a result of inadequate well design. All blowouts were of a relatively short duration (one to two days) and none significantly affected the public or the environment.

Fifty-two kicks were reported in 2008, which equates to an occurrence rate of about 3.4 kicks per 1000 wells drilled. This rate is lower than the average kick rate of 5 per 1000 recorded over the last five years.

Five blowouts occurred during well servicing operations in 2008, all of which were of a short duration with minimal environmental impact.

Fifteen blowouts were registered in the "other" category during 2008, one less than in 2007. All of the 2008 incidents were of a short duration and had minimal impact on the public or the environment.

Of the 61 drilling operations not in compliance in 2008, 36 were found to be Low Risk noncompliant and 25 High Risk noncompliant (this includes critical wells, noncritical wells, and investigations).

The ERCB suspended drilling operations at all rigs with High Risk noncompliant items until these items were corrected. The total shutdown time was about 77 hours in 2008, compared to 420 hours in 2007.

In 2009, the ERCB will continue to focus on conducting operator awareness sessions to increase industry's understanding of requirements and improve compliance levels.

Oil Facilities

Field staff conducted 3782 oil facility inspections in 2008. Of these, 2809 facilities were found to be in compliance with ERCB requirements. Where compliance issues were identified, 907 facilities were issued Low Risk noncompliance enforcement and 66 were issued High Risk noncompliance enforcement. Appropriate enforcement action was taken on all facilities to bring them into compliance.

Pipelines

The pipeline failure rate was 2.1 per 1000 km of pipeline in 2008, unchanged from 2007. The average pipeline failure rate since 2000 is 2.5/1000 km.

All pipeline failures are inspected or an investigation is conducted into the failure mechanism. In 2008, staff conducted 376 inspections and investigated 598 incidents. The total inspections and investigations include the 109 contact damage incidents that occurred.

Inspections revealed 835 operations in compliance with ERCB requirements, while 47 were found to be Low Risk noncompliant and 92 High Risk noncompliant. All noncompliant items were addressed in accordance with *Directive 019: ERCB Compliance Assurance—Enforcement*. Although corrosion continues to be the main cause of pipeline failures, 2008 saw fewer internal corrosion failures compared to historical data.

Field staff undertook 437 pipeline construction and pressure test inspections in 2008, of which 390 complied with ERCB requirements, 34 had Low Risk noncompliant items, and 13 had High Risk noncompliant items. All noncompliant items were brought into compliance. This compares to 443 pipeline construction and pressure test inspections conducted in 2007, of which 393 were found to be in compliance with ERCB requirements, 36 had Low Risk noncompliant items, and 14 had High Risk noncompliant items.

ERCB Field Surveillance staff will continue to carry out additional inspections on construction in 2009 to educate licensees and identify noncompliant items.

Sulphur Recovery

Sulphur recovery efficiencies at gas plants recovering saleable sulphur is at 99.1 per cent. Overall, sulphur emissions have decreased by 49 per cent since 2000, from 78 000 to 39 500 tonnes.

Spills

In 2008, 1461 spills were reported to the ERCB, a decrease from 1508 in 2007. Of the 1461 spills,

- 73 were priority 1 (5.0 per cent),
- 265 were priority 2 (18.1 per cent), and
- 1123 were priority 3 (76.9 per cent).

In 2008, more than 75 per cent of all spills were low volume and were contained on lease. Inspections were conducted on the cleanup of 847 spills, of which 709 were in compliance with ERCB regulations, 80 had Low Risk noncompliances, and 58 had High Risk noncompliances.

The spill volumes of produced water and liquid hydrocarbon were 26 211 cubic metres (m^3) and 3927 m^3 respectively in 2008. Produced water spill volumes increased, while liquid hydrocarbon spill volumes decreased slightly. The area affected and impacts on the environment were minimal.

In 2009, ERCB field staff will continue to work with industry to improve operating practices through increased staff training, equipment monitoring, and reviewing of corrosion mitigation programs.

Waste Management

Field staff carried out 90 waste management inspections in 2008, which revealed that 46 waste management programs were in compliance with ERCB regulations, while 38 were issued Low Risk noncompliance enforcement and 6 were issued High Risk noncompliance enforcement.

Responding to Public Concerns

In 2008, the number of public complaints decreased by 5 per cent from 2007. As some complaints identified more than one issue, the ERCB recorded 891 issues associated with 744 complaints.

Responding to and effectively addressing these concerns remains a top priority for the ERCB. Each month, a random complaint call-back survey is conducted in an effort to improve the level of satisfaction with both ERCB and industry responses. Staff analyze the information to ensure that appropriate complaint response procedures are being used and that all questions and concerns are addressed. Results of the 2008 survey indicate that

- 83 per cent of the individuals surveyed said their concerns were satisfactorily resolved, and
- 97 per cent of the individuals surveyed were satisfied with the response from the ERCB.

The ERCB Field Centres will continue to be on call 24 hours a day to ensure an appropriate response to all complaints.

Community and Aboriginal Relations Activities

In 2008, Community and Aboriginal Relations (CAR) staff engaged 167 key stakeholders to discuss the ERCB's roles and responsibilities. In addition, CAR conducted 172 presentations to communities, industry, and government and staff attended 209 synergy group meetings in 2008. The ERCB strongly endorses this effective and cooperative approach, and in 2008 CAR staff contributed to the formation of 9 new synergy groups. Staff also participated in 47 community/industry open houses in 2008. Such forums allow the ERCB to interact with all stakeholders.

CAR staff lent support to ERCB hearings throughout 2008, which included providing the public and other stakeholders with assistance, clarification, and information regarding the hearing process and information on the ERCB. The CAR team was present at 12 hearings in 2008.

Staff also conducted 104 aboriginal community contacts in 2008, which represents a 55 per cent increase from 2007. These contacts typically involve meetings between aboriginal leadership, the band oil and gas liaison, and ERCB personnel.

Emergency Planning and Assessment

The Emergency Planning and Assessment (EPA) team is responsible for ensuring that industry meets the requirements set out in *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*. In April 2008, a revised edition of *Directive 071* was issued, introducing some new requirements. In conjunction with this release, EPA created new processes that became effective in September 2008.

Also in 2008, EPA staff reviewed and approved

- 251 drilling and/or completion emergency response plans (ERPs),
- 41 production facility plans,
- 75 ERP supplements, and
- 8 high vapour pressure (HVP) plans.

EPA no longer accepts requests for reduced emergency planning zones.

Because all ERPs must be technically complete prior to receiving approval, 33 applications were closed by the EPA group and an additional 10 were withdrawn by the licensee.

In addition, since fall 2008 the ERCB conducted 16 full ERP assessments and 28 partial assessments. Any issues of noncompliance were addressed through additional training and exercises, and no enforcement action was issued during this time. Staff also attended 8 ERP exercises.

Safety

PS/FS Branch staff adhere to the provincial work-alone policy and are required to make daily call-in and call-outs. This process ensures that staff are safe throughout the day, their location of work is known, and their return is also noted at the end of each day.

All ERCB field vehicles are equipped with a comprehensive array of safety equipment, and field staff have appropriate personal protective equipment. PS/FS procedures include a hazard identification policy to identify potential risks and eliminate potential impacts on staff.

On a monthly basis, staff must complete in-house safety training to ensure that they meet provincial requirements.

In 2008, PS/FS staff drove a total of 3 545 750 km. PS/FS has a safe driving program and award system to recognize staff for achieving various safe driving milestones.

Field Incident Response Team (FIRST)

The PS/FS Branch created the Field Incident Response Support Team (FIRST) to lead the ERCB in preparing for and responding to significant oil and gas emergency events. The basic premise is for FIRST to assist ERCB Field Centres in the event of a complex oil and gas emergency.

Some of the team's goals for 2009 are to streamline internal reporting and communication protocols, develop better systems to communicate with the ERCB's Government of Alberta emergency response partners, enhance working relationships with the ERCB EPA team and field staff, build relationships with the CAR team, explore external communication protocols, and review internal response and protocols and the approval process.

These goals will ensure that FIRST meets its objectives of high standards for public safety, environmental protection, and resource conservation.

Setback Review

In response to a recommendation by the Provincial Advisory Committee on Public Safety and Sour Gas, the PS/FS Branch initiated a study in the spring of 2008 to review its current sour gas setbacks.

The development of a new model, ERCBRISK, is expected to be completed in 2009. It will be used in combination with the ERCBH2S dispersion model to estimate the risk to the public associated with sour gas facilities and to assess whether the current ERCB setback distances are adequate.

1 Introduction

Staff in the Public Safety/Field Surveillance (PS/FS) Branch of the Energy Resources Conservation Board (ERCB) are responsible for inspecting Alberta's energy infrastructure to ensure safe development of its resources. This means ensuring that companies follow the rules and regulations set out by the ERCB while protecting public safety, minimizing environmental impact, and ensuring effective conservation of resources.

This *ST57* annual report outlines the compliance results found by staff while conducting inspections and investigations throughout the province. In 2006 and 2007, this information was combined with the proactive compliance results for the entire ERCB and captured in the *ST99* report. To effectively convey and highlight the activities carried out by PS/FS field staff, the two sections have been separated. For detailed information on the proactive compliance results, please see *ST99-2009* on the ERCB Web site www.ercb.ca.

ST57 details industry's compliance with ERCB requirements in five main categories:

- Drilling and Servicing
- Environment
- Gas Facilities
- Oil Facilities
- Pipelines

It also includes information on the roles and responsibilities of PS/FS staff, including the activities conducted by the Community and Aboriginal Relations (CAR) and Emergency Planning and Assessment (EPA) sections, as well as major initiatives and future goals.

The ERCB examines the information gathered here and uses it to predict trends, assess training needs, and allocate resources efficiently. Most importantly, it also uses this information to determine future actions to improve industry's understanding of and compliance with all ERCB requirements.

2 Summary of Activity

2.1 Role of Public Safety / Field Surveillance Staff

The Public Safety/Field Surveillance (PS/FS) Branch was created in 2006 and has grown significantly in size since then. The branch consists of three groups—Public Safety, Field Surveillance, and Advisory—and currently has 166 employees.

The Public Safety Group includes two sections. Community and Aboriginal Relations (CAR) focuses on proactively engaging stakeholders to ensure understanding and increase awareness of the role of the ERCB. The second section, Emergency Planning and Assessment (EPA), focuses on emergency response plan (ERP) reviews, approvals, and assessments and setback requirements.

The Field Surveillance Group focuses on surveillance of oil and gas activities, enforcement of rules and regulations, and incident response.

The Advisory Group focuses on providing branch staff with access to learning and career development opportunities, managing regulatory change through project management advice, training and services, and providing strategic planning advice and services.

A large number of PS/FS staff work out of the nine field centres located throughout Alberta (see Figure 2.1). This includes 80 field inspectors and the majority of the CAR section. The remaining PS/FS staff work out of the Calgary head office. There is also a regional ERCB office located in Fort McMurray, which is responsible for mineable oil sands development and processing.

ERCB Field Centre boundaries and Fort McMurray Regional Office

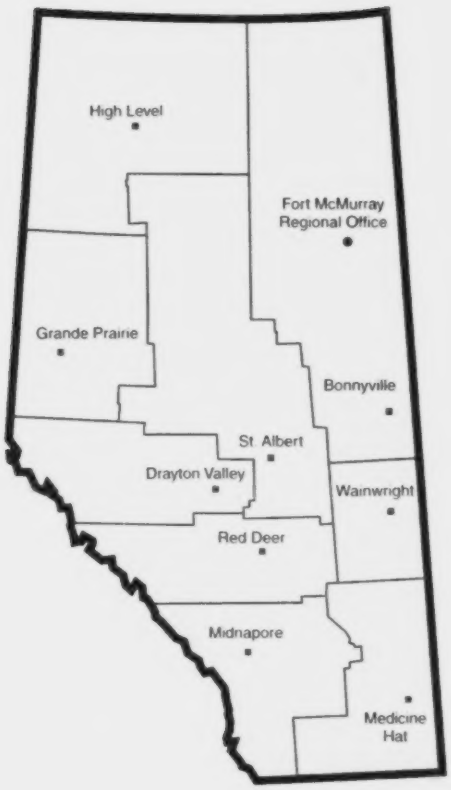


Figure 2.1

Field staff have three primary goals:

1) **Industry Performance**: Minimize potential impacts on public safety and the environment from oil and gas activity by

   - inspecting oil and gas operations to ensure that licensees are in compliance with all applicable standards, specifications, and approval conditions;
   - focusing inspection activities on higher-risk facilities, such as sour gas wells, pipelines, and facilities located near environmentally sensitive locations;
   - focusing on licensees with poor inspection records, with the goal of long-term improvements; and
   - taking appropriate enforcement action when noncompliance occurs.

2) **Emergency Preparedness and Response**: Timely, effective, and coordinated response to minimize the effects on the public and the environment by

- responding to oil and gas emergencies;
- responding to and addressing complaints related to energy development and environmental issues; and
- monitoring the cleanup of oil and saltwater spills.

3) **Stakeholder Engagement**: Proactively engage stakeholders to ensure understanding and increase awareness of the role of the ERCB by

- participating in meetings to answer questions and provide information about the ERCB's regulatory process, roles, and responsibilities;
- educating stakeholders on new and revised ERCB requirements;
- building relationships to inspire trust and confidence in the ERCB; and
- collaborating with stakeholders to ensure that decisions and processes are in the public interest.

2.2 Inspections and Enforcement

In 2008, the total number of field inspections, including well site and air monitoring inspections, was 18 667, compared to 16 408 inspections in 2007. The increase in the number of inspections in 2008 was due to several factors: a large increase in well site inspections, a decrease in the number of well control incidents, resulting in less time spent on the investigation of these events, and the inclusion of air monitoring inspections.

Industry's compliance record with respect to satisfactory inspections increased to 76.5 per cent in 2008 from 73.3 per cent in 2007. The Low Risk noncompliances were 21.5 per cent in 2008, compared to 24.2 per cent in 2007. The overall percentage of High Risk noncompliances was 2.0 in 2008, compared to 2.5 in 2007. This increase in compliance is due in part to staff focusing on conducting operator awareness sessions across the province to increase industry's awareness and understanding of ERCB requirements.

Inspections are prioritized based on the weighting of three key criteria—***o***perator (licensee/contractor) history, site ***s***ensitivity, and ***i***nherent risk (OSI)—with respect to the facility or operation. Field staff focus on licensees with previous Low or High Risk noncompliances, including those with a persistent noncompliance history. Sensitivity is determined by whether the facility is in a forested or agricultural area, with an increased inspection emphasis on areas with high numbers of public complaints and a high frequency of environmental incidents. The inherent risk of a facility or operation is determined by reviewing specific technical details about the facility, such as the complexity of the operation and whether the facility is sweet or sour.

The ERCB will continue to encourage licensees to proactively identify issues and ensure compliance.

PS/FS staff ensure that compliance is met through surveillance activities, such as inspections and investigations. Staff refer to the ERCB enforcement process detailed in *Directive 019: ERCB Compliance Assurance—Enforcement,* which came into effect on January 1, 2006. This is a risk-based two-tier policy, with increased emphasis on prevention, while retaining manual escalation when required. All noncompliance items discussed in this report are referred to as Low Risk or High Risk.

Directive 019 was created to improve process clarity, focus, and efficiency and is built on the principles that

- public safety and environmental protection will not be compromised;
- enforcement will be timely, effective, and appropriate; and
- licensees are responsible to comply with ERCB requirements and processes.

Directive 019 clearly explains what licensees must do when a noncompliance is identified, the enforcement process and consequences for any noncompliances, the appeal process, the voluntary self-disclosure policy, and the availability of compliance information.

Additional information regarding *Directive 019* is on the ERCB Web site www.ercb.ca.

In this report, the terms "in compliance," "Low Risk," and "High Risk" are used. It is important that the definition of each is understood to properly interpret the statistics. There are numerous requirements in each inspection discipline, and even if one noncompliance item is identified, the resulting inspection finding is considered noncompliant. The definitions for Low and High Risk noncompliances apply to these terms throughout this report:

- **Compliance**—A licensee is found in compliance with all regulations/requirements.
- **Low Risk noncompliance**—Using the Compliance Assurance Risk Assessment Matrix, the assessment of the qualitative measures of consequences is minimal. A contravention of regulation(s)/requirement(s) is found that does not result in a direct threat to the public and/or the environment and does not adversely affect oil and gas operations.

  Examples of Low Risk noncompliances are facility signage missing and garbage and debris not stored in a reasonable manner at an oil or gas facility.

- **High Risk noncompliance**—Using the Compliance Assurance Risk Assessment Matrix, the assessment of the qualitative measures of consequences is more significant. A contravention of regulation(s)/requirement(s) is found that the licensee has failed to address and/or that has the potential to cause a significant impact on the public and/or the environment.

  Examples of High Risk inspection items are hydrogen sulphide (H_2S) release causing odours off lease at an oil battery and required blowout preventer (BOP) drills not conducted.

The ERCB continues to classify all of its requirements as Low or High Risk and document them under the appropriate compliance category. For an overview of current ERCB categories, contact personnel, and risk assessed noncompliances, go to the ERCB Web site www.ercb.ca under Home : Industry Zone : Compliance and Enforcement : Risk Assessed Noncompliance.

The ultimate goal of ERCB enforcement is to ensure compliance with the requirements that are written, monitored, and enforced on behalf of Albertans, our stakeholders. Compliance ensures that resource activity within the province is conducted in a manner that protects public safety, minimizes environmental impact, preserves equity and ensures effective conservation of resources.

Table 2.1 summarizes the field inspections and investigations that occurred in 2008. This includes the number of initial[1] inspections in each category, the number of operations found in compliance, and the numbers with Low Risk and High Risk noncompliances.

In 2008, PS/FS continued to have ERCB technical specialists focus on training field inspectors in conducting inspections and applying appropriate enforcement. This was achieved by holding joint field inspections at various locations throughout the province and allowing staff the opportunity to learn from senior staff. This collaborative and effective approach is expected to continue in 2009.

Table 2.1. Field inspections/investigations, 2008[1]

Category	Initial	In compliance	Low Risk noncompliance	High Risk noncompliance
Drilling rigs	357	296	36	25
Service rigs	288	264	19	5
Oil production facilities	3 782	2 809	907	66
Gas production facilities	2 023	1 300	666	57
Pipeline construction/ testing	437	390	34	13
Pipeline failure/hits	974	835	47	92
Pipeline operations	200	102	45	53
Waste management facilities	90	46	38	6
Drilling waste management				
-Nonroutine	3	2	1	0
-Routine	129	115	6	8
Air monitoring inspections	548	540	0[2]	8
Well site inspections	9 836	7 578	2 215	43
TOTAL	18 667	14 277	4 014	376

[1] For definitions of compliance and Low Risk and High Risk noncompliances, see Section 2.2. Details for each inspection category are found in various sections throughout this report.

[2] Any H_2S odours found off lease are High Risk noncompliances, as there is potential to affect the public. Therefore there is no Low Risk noncompliance for air monitoring inspections and investigations.

In 2009, staff will also focus on pipeline corrosion, increasing air monitoring activities, and reduction of odours throughout the province.

Table 2.2 summarizes the facilities and operations that were shut down in 2008 as a direct result of ERCB enforcement action (also see Figure 2.2). In 2008 there was a significant decrease in the approximate number of suspensions due in part to staff working with industry to ensure understanding of and compliance with ERCB rules and regulations.

2.3 Staff Training and Safety

Learning and development opportunities are essential to help individuals meet their goals and objectives, while ensuring that the goals of the organization are met. Training is available for all PS/FS Branch staff and includes internal and external training to increase skills, knowledge, and experience.

In 2008, the Advisory Group began work on a Comprehensive Learning Program (CLP) designed to better equip staff with the knowledge and training necessary to stay abreast of the latest technical and regulatory developments. Safety and technical competence are the key elements of this program. To date, the knowledge requirements are complete and the training curriculum is under development. The CLP will be fully functional in 2009.

Table 2.2. Facilities/operations shut down at PS/FS request, 2008

Type	Approximate number of suspensions	Average duration of shutdown	Most common reasons for suspensions
Drilling rigs	25	3.08 hours	• BOP control systems • Crew training • Bleed-off systems
Service rigs	5	0.6 hours	• Compliance with other ERCB requirements • BOP systems
Gas facilities	16	15 days	• H_2S emissions off lease • Inadequate spacing • Underground tanks not integrity tested
Oil production facilities	34	30 days	• Spacing • Flaring
Pipelines	53	41 days	• Ground disturbance activities • Corrosion integrity work
Well sites	10	23 days	• Inadequate fencing • Inadequate lease diking • Public/ERCB notification not conducted/ inadequate
Total	**143**		

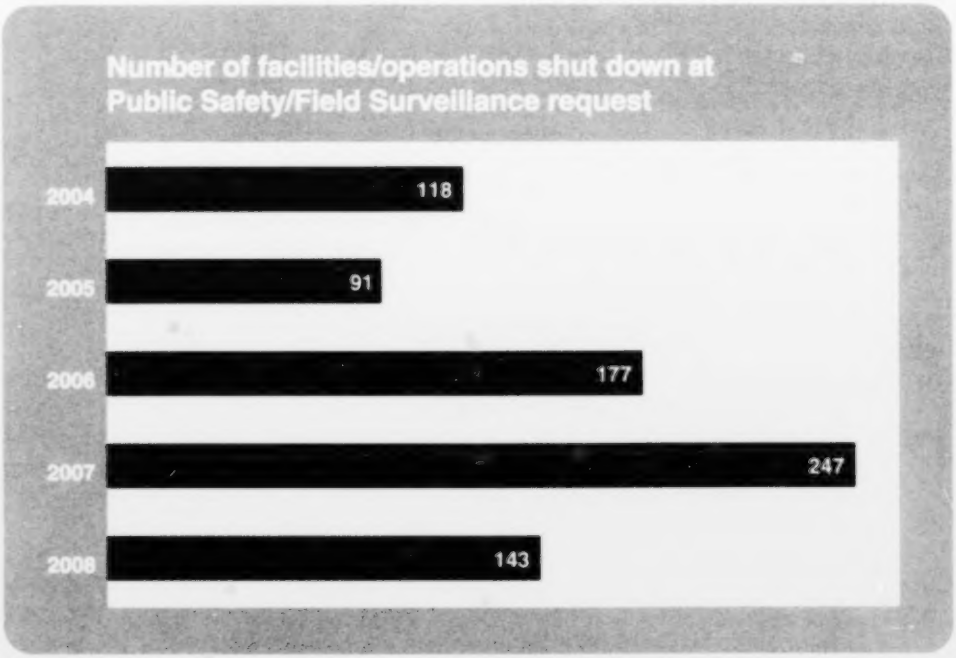


Figure 2.2

Another crucial part of training is the safety component. Staff must be equipped with all the necessary tools and techniques to ensure that they can perform their jobs safely. Depending on their role, PS/FS Branch staff are required to maintain current certification in a variety of safety courses, including First Aid, CPR, H2S Alive, Incident Command System, and Collision Avoidance.

Staff are also encouraged to attend other relevant technical courses and conferences and to maintain memberships in professional associations, such as the Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA), the Association of Science and Engineering Technology Professionals of Alberta (ASET), and International Association for Public Participation (IAP2).

On a provincial level, other programs are in place to ensure staff safety. These include corporate- and branch-level safety manuals with related policies and procedures. In 2009, staff will be reviewing both manuals to ensure that they are aligned with current provincial Occupational Health & Safety (OH&S) requirements.

All ERCB field vehicles are equipped with a comprehensive array of safety equipment, and field staff have appropriate personal protective equipment. PS/FS procedures include a hazard identification policy to identify potential risks and eliminate potential impacts on staff. PS/FS Branch staff adhere to the provincial work-alone policy and are required to make daily call-in and call-outs. This process ensures that staff are safe throughout the day, their location of work is known, and their return is also noted at the end of each day.

On a monthly basis, staff must complete in-house safety training to ensure that they meet provincial requirements. Each Field Centre designates a safety representative who leads this training for the respective centre.

In 2008, PS/FS staff drove a total of 3 545 750 kilometres. PS/FS has a safe driving program and award system to recognize staff for achieving various safe driving milestones. An example includes driving 100 000 kilometres incident free. If an incident occurs, it is reviewed and steps are taken to prevent future occurrences. The safety team also provides regular safety awareness bulletins to the branch to make staff aware of incidents, potential risks, and necessary precautions.

2.4 Public Complaints

2.4.1 Response to Public Complaints

Public complaints are treated as a priority at the ERCB. Staff are available 24 hours a day to ensure that concerns are responded to and addressed. The ERCB's goal is to ensure prompt, effective, and lasting resolution to the issues identified, while making sure that the public and the environment are protected.

The ERCB recognizes that activity levels can affect associated public concerns. We will continue to respond to and address all public complaints. When a complaint is received that is outside of the ERCB's jurisdiction, the individual with the complaint is promptly directed to the appropriate government agency or organization so the matter can be addressed without delay.

In 2008, public complaints decreased about 5 per cent compared to 2007. As some complaints identified more than one issue, the ERCB recorded 891 issues associated with 744 complaints (see Figure 2.3).

The decrease in public complaints received from the ERCB Field Centres over the past three years can be partially attributed to licensees implementing good neighbour practices in their area of operations, thus ensuring that residents are kept informed of the operations. Residents are also more often in contact with licensees to discuss any concerns or questions.

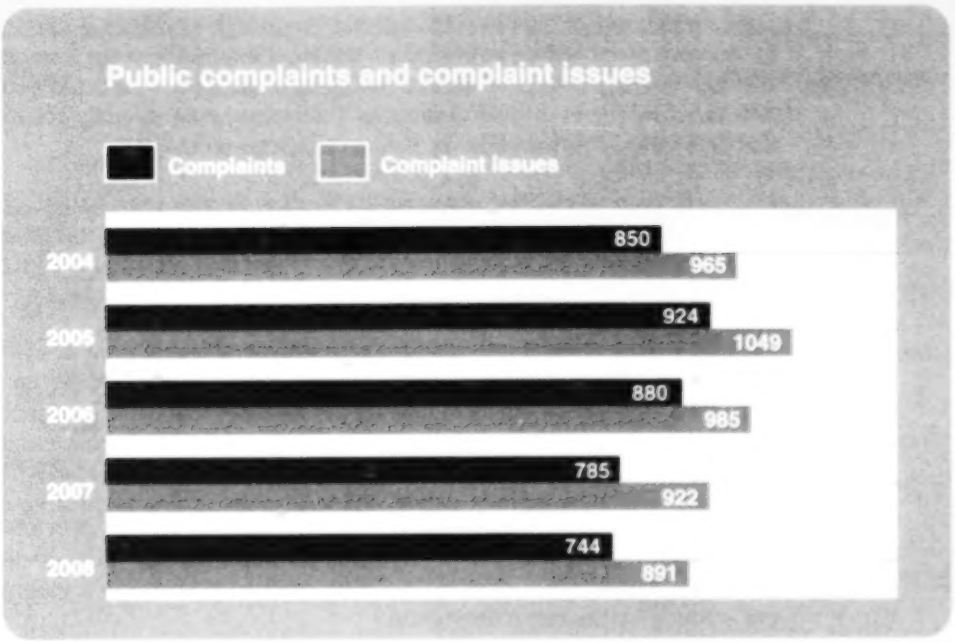


Figure 2.3

In 2009, staff will continue to educate the public about ERCB roles and responsibilities as a regulator and industry's roles and responsibilities when development occurs. Staff will also continue to emphasize to industry the benefits and importance of proactive and effective communication with stakeholders.

2.4.2 Complaint Follow-up

Each month, the ERCB conducts a random complaint call-back survey as part of its effort to improve the level of satisfaction with both ERCB and industry responses.

Staff analyze the information to ensure that appropriate complaint response procedures are being used and any questions or concerns are addressed in a timely manner.

Results of the 2008 survey indicate that

- 83 per cent of the individuals surveyed said their concerns were satisfactorily resolved, a decrease when compared to 93 per cent in 2007;
- 97 per cent of the individuals surveyed were satisfied with the response from the ERCB, the same as 2007.

If individuals were not satisfied by the response to their complaints, ERCB staff reviewed the situation to ensure that the complaints were dealt with appropriately. Any matters that needed additional attention were addressed.

The ERCB encourages proactive communication between industry and their stakeholders as an opportunity to minimize the number of complaints.

In 2009, staff will be reviewing the survey in detail and updating it to reflect feedback received from stakeholders.

2.4.3 Types of Public Complaints

The ERCB receives complaints on a variety of issues regarding the upstream petroleum industry. The four most common concerns (see Figure 2.4) continue to be

- operational impacts (noise, flaring, spills),
- odours (hydrogen sulphide [H_2S], sulphur dioxide [SO_2], total hydrocarbon content),
- physical impact (lease management, property damage, public hazard),
- and health issues.

Of the total complaints received in 2008, odour concerns represented 41 per cent.

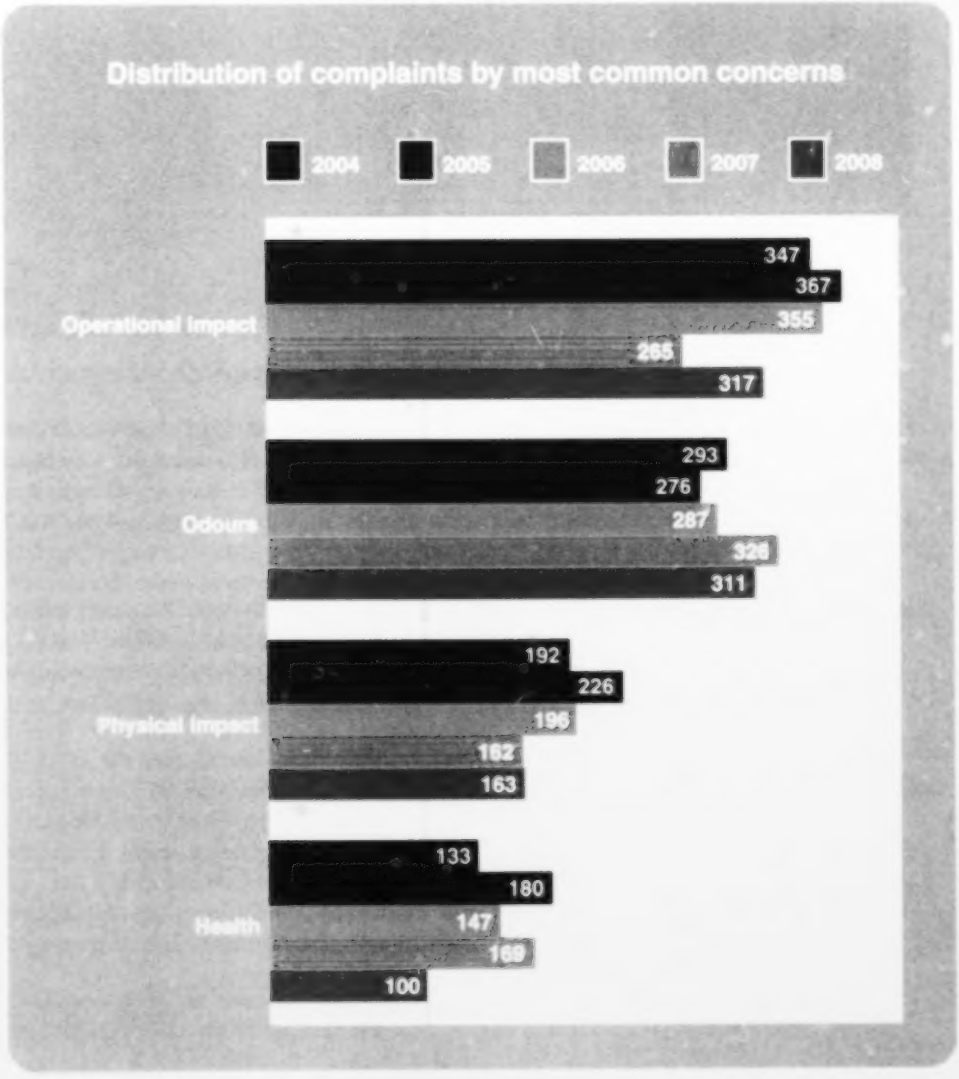


Figure 2.4

Well installations were the source of 32 per cent of public complaints (see Figure 2.5).

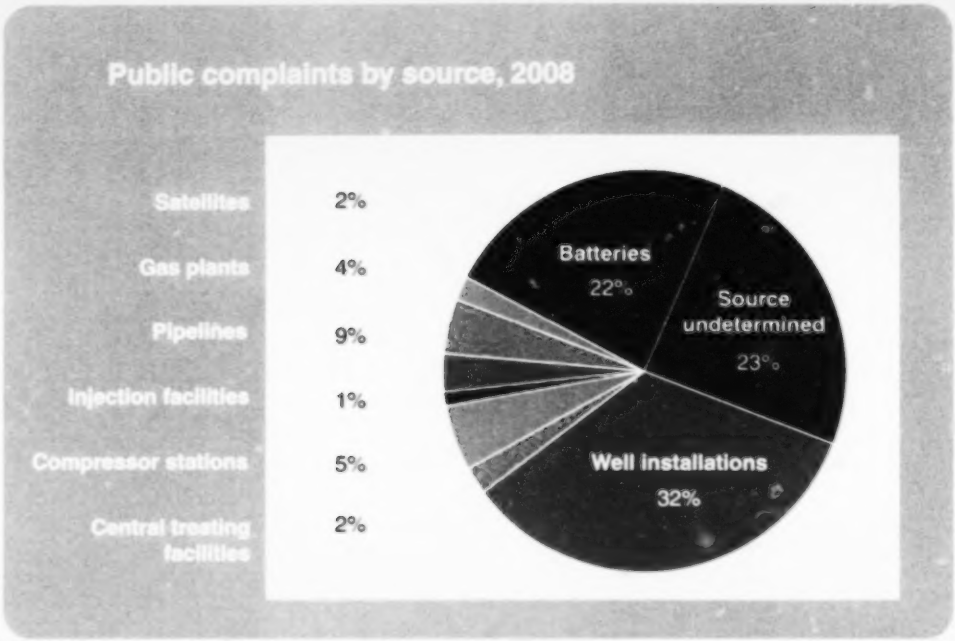
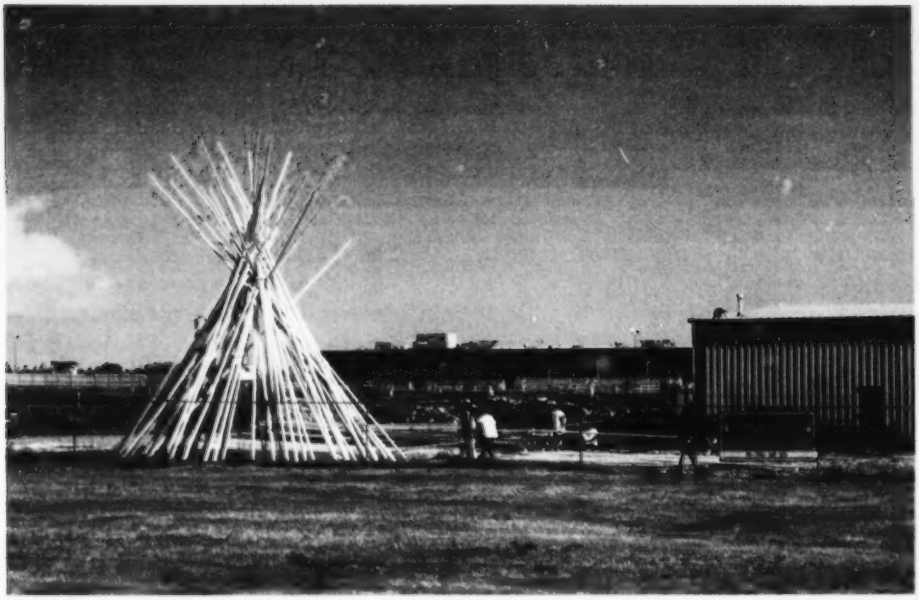


Figure 2.5

In 2008, the ERCB also received a number of complaints (such as of odours) for which an investigation of the area could not determine the source. Such complaints are categorized as "source undetermined," since they cannot be linked to a specific facility. In 2008, 23 per cent of all public complaints received could not be linked to a specific source.

Staff meet with industry to outline the most common sources and causes of public complaints and describe measures to reduce the impacts. In 2009, staff will hold more proactive meetings with licensees in a continuing effort to reduce complaints.

3 Public Safety



3.1 Community and Aboriginal Relations Activities

The Community and Aboriginal Relations (CAR) team engages stakeholders to ensure understanding of the ERCB's mandate and its processes. This is achieved through various activities, ranging from kitchen table discussions to large-scale community meetings. CAR also helps to establish new relationships and enhance existing ones by creating a dialogue among the interested parties. Another key role of the CAR team is collaborating with stakeholders to ensure that their concerns and feedback regarding the ERCB are heard. CAR staff work out of many of the ERCB's nine Field Centres. This allows the ERCB to build a strong local presence and develop better relationships with key stakeholders across Alberta. Through these activities, the CAR team works to inspire trust and confidence in the ERCB.

In 2008, the team experienced additional growth as new members were hired in the Bonnyville, Drayton Valley, Grande Prairie, Medicine Hat, and Midnapore Field Centres. Additional staff in Calgary coordinate performance reporting, monitor trends from emerging issues, and organize public events, such as open houses and trade shows. The team has grown from 3 members in 2005 to 16 in 2008. The CAR team's activities are expected to increase in 2009, as the new staff complete their training and are ready to engage with stakeholders across the province.

CAR will focus on more proactive meetings with stakeholders, development of key messages, youth education, and effective measurement of activities in 2009.

3.1.1 Key Stakeholder Contacts

In 2008, CAR staff engaged with 167 key stakeholders, discussing the ERCB's roles and responsibilities. (See Figure 3.1.) Common key stakeholders the CAR team engages with include elected officials (MLAs and municipal governments), other provincial agencies

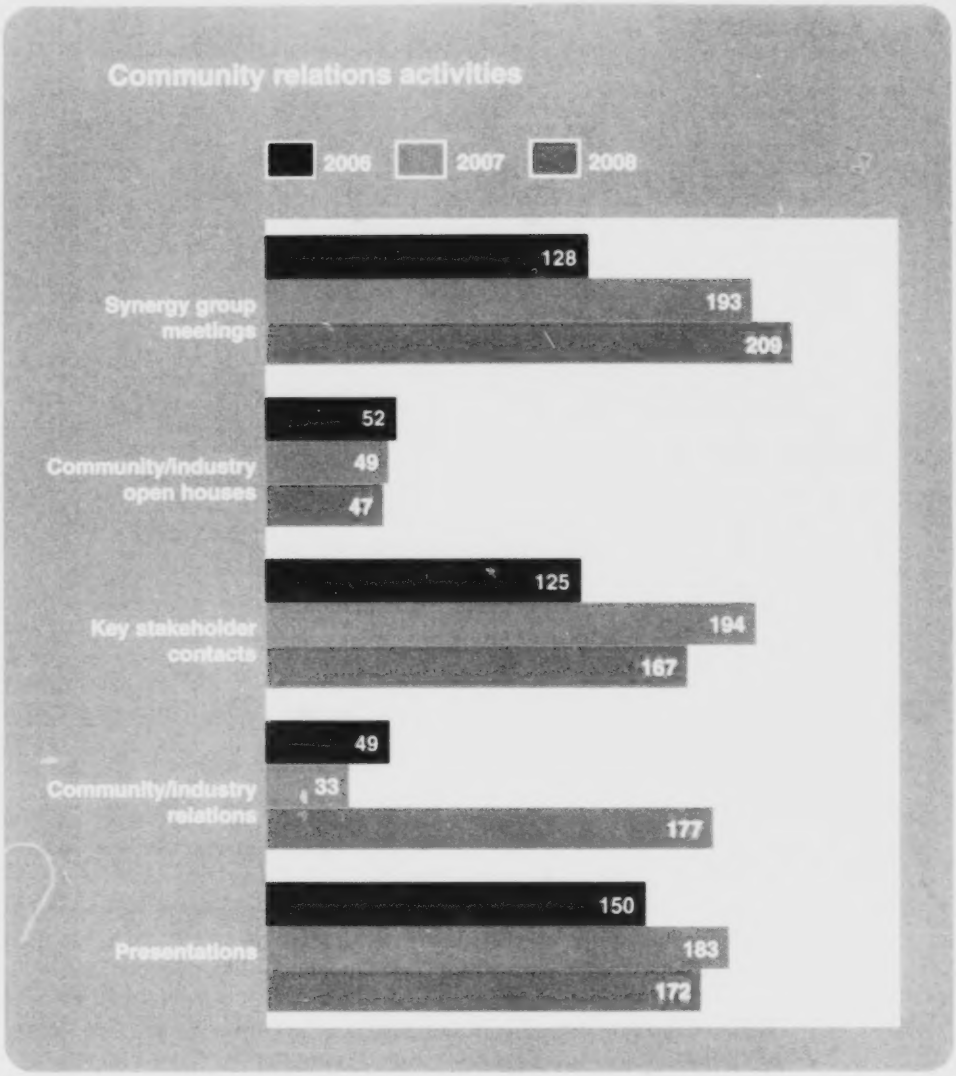


Figure 3.1

(Alberta Environment, Alberta Sustainable Resources Development [SRD], and Alberta Emergency Management Agency [AEMA]), first responders (fire chiefs, RCMP), and individual landowners. In addition, staff also gave 172 presentations to community, industry, and government. (See Figure 3.1). Presentations by CAR staff in 2008 often covered changes to ERCB directives, such the new editions of *Directive 071* and *Directive 060*, ERCB roles and responsibilities, and landowner rights.

A more focused effort to participate in trade shows also occurred in 2008, as staff made numerous contacts through the 13 trade shows attended. Staff attended conferences hosted by the Alberta Association of Municipal Districts and Counties (AAMD&C), the Alberta Urban Municipalities Association (AUMA), and Synergy Alberta, as well as various agricultural conferences. These conferences are especially beneficial, as staff have the opportunity to liaise with many stakeholders in a face-to-face setting. In the coming year, the team will continue to attend such events in an effort to reach larger

audiences throughout the province and share key messages related to the upstream oil and gas industry.

3.1.2 Community/Industry Relations

The CAR team participates in many smaller scale meetings, often with only the licensee, resident, or landowner, in an effort to provide information, clarify rules and regulations, and encourage relationships. Meeting one on one allows the parties to be more open in an informal setting while dealing with issues. In 2008, staff took part in 177 such meetings, a significant increase compared to the 33 meetings recorded in 2007. (See Figure 3.1.)

When staff recognize the need to improve the dialogue between landowners and industry, they often refer the parties to the ERCB Appropriate Dispute Resolution (ADR) team. With specialized skills in conflict resolution, the ADR team is able to engage the parties to help resolve specific matters at issue.

CAR team members will continue to participate in community/industry relations meetings in 2009.

3.1.3 Open Houses

In 2008, the ERCB held one open house in the Grande Prairie area. Staff from the Grande Prairie Field Centre and CAR hosted various booths to provide information on ERCB roles, responsibilities, and regulations. There were several displays showcasing the ERCB's state-of-the-art air monitoring unit, geological research samples, and other pertinent information. Equipment used in oil and gas development was also on hand, including Western Canadian Spill Services' recovery tools used during a spill.

CAR staff also participated in 47 community/industry open houses in 2008. (See Figure 3.1.) These open houses are normally in regard to a specific proposed development. Attendance by CAR at these events opens the door for concerned citizens to speak directly to an ERCB staff member about potential concerns.

Staff will continue to attend community/industry open houses to expand awareness of the ERCB's roles and responsibilities when companies propose development in Alberta communities.

3.1.4 Synergy Groups

To ensure that the impact of resource development and operations is minimized, synergy groups are formed to identify issues and work collaboratively on solutions to concerns identified. Synergy groups usually involve public, industry, and government representatives and provide a forum for all participants to enhance relationships, exchange information and share knowledge.

The size, structure, and membership of synergy groups depend on factors such as population, industry activity, geographic location, and sensitivity of an area. Staff attended 209 synergy group meetings in 2008. See Figure 3.1. The ERCB strongly endorses this effective and cooperative approach, and in 2008 ERCB staff contributed to the formation of 9 new groups. Table 3.1 lists the 60 active synergy groups in Alberta that ERCB staff were involved in during 2008.

In a continuing effort to contribute to the effectiveness of synergy groups, numerous PS/FS staff sit on working committees related to Synergy Alberta.

For more information on the synergy groups and related events in Alberta, see the Synergy Alberta Web site at www.synergyalberta.ca.

Table 3.1. Active synergy groups in Alberta

Bonnyville Field Centre
- Bonnyville Oil Producers Trucking Committee
- Lakeland Industry & Community Association

Grande Prairie Field Centre
- Foothills Mutual Aid Co-op
- Grande Prairie Working Committee
- Greater Kakwa Area
- Hay/Zama Committee
- Peace Air Shed Zone Association
- Peace Arch Operators Group
- Peace Oil Sands Synergy Group
- Rainbow Lake Operators Group
- Saddle Hills Awareness Committee

Red Deer Field Centre
- Butte Action Committee
- Calumet Synergy Group
- Central Mountain Action Guild
- Clearwater Mutual Aid Co-op
- Harmattan Elkton Community Advisory Committee
- Olds Community Advisory Panel
- Panther Advisory Group
- Parkland Airshed Management Zone
- Pine Lake Surface Rights Group
- Springvale Surface Rights Association
- Sunchild/O'Chiese Mutual Aid Group
- Sundre Petroleum Operators Group
- West Central Stakeholder Group

Medicine Hat Field Centre
- Shallow Gas Management Association
- Society of Grassland Naturalists
- Palliser Airshed Society

Drayton Valley Field Centre
- Alberta Utility Location and Coordination Council
- Battle Lake Synergy Group
- Genesee Synergy Group
- Pembina Area Mutual Aid Group
- Pembina Area Synergy
- West Central Air Shed Society
- Yellowhead Synergy Group

Midnapore Field Centre
- Balzac Community Advisory Panel
- City of Calgary Synergy Group
- Cochrane Pipeline Operators Committee
- Crossfield and District Synergy Group
- Indus Community / Petroleum Industry Association
- Quirk Creek Gas Processing Community Committee
- Southwest Alberta Sustainable Community Initiative
- Taber Area Operators Group
- Turner Valley Oil and Gas Group
- Vulcan Area Public and Petroleum Association
- Waterton Advisory Group
- Wheatland Surface Rights Action Group

St. Albert Field Centre
- Alberta Industrial Heartland Association
- East Parkland Liaison Committee
- Edmonton Area Pipeline Utility Operators Committee
- Fort Assiniboine and Area Multi-Stakeholder Association
- Northeast Capital Industrial Association
- Rimbey Multi-Stakeholder Group
- Round Hill-Dodds Agricultural Protection Association
- Transportation & Utilities Corridor Committee
- Watelet Gas Plant Area Residents Group
- Western Canada Cavern Operators Group
- Wetaskiwin Synergy Initiative

Wainwright Field Centre
- Alliance Operators Group
- Hardisty Terminal Complex Group
- North Hayter Operators Group

3.1.5 Hearing Support

Hearings are held when the ERCB receives an objection from a person who may be directly and adversely affected by a proposed project. They may vary in length from a couple of days to several weeks.

CAR staff contributed support to ERCB hearings throughout 2008, including providing the public and other stakeholders with assistance, clarification, and information regarding ERCB processes.

For most hearings, CAR staff assist with a tour for the Board panel and staff of the proposed location of the oil and gas development. This allows the Board panel a better opportunity to see the proposed area. While in attendance at 12 hearings in 2008, CAR staff were available to deal with other issues not directly related to the application being heard, allowing ERCB Applications Branch staff to deal specifically with the application before the Board panel.

CAR staff will continue to provide hearing support to the ERCB's Applications Branch in 2009.

3.1.6 Aboriginal Relations

The ERCB Aboriginal Relations program aims to build relationships with First Nations and Métis communities and organizations. Contact between the ERCB and aboriginal peoples has led to increased communication and trust, along with a collective understanding of the goals of each group.

Aboriginal Relations staff conducted 104 community contacts in 2008. This included 81 First Nations community visits, 11 Métis community visits, and 12 visits with other aboriginal organizations such as IOGC and CFAR. These contacts typically involve meetings between aboriginal leadership, the aboriginal community's oil and gas liaison, and ERCB personnel. CAR staff are responsible for building relationships with the 47 First Nations and 8 Métis settlements throughout Alberta. See Figure 3.2.

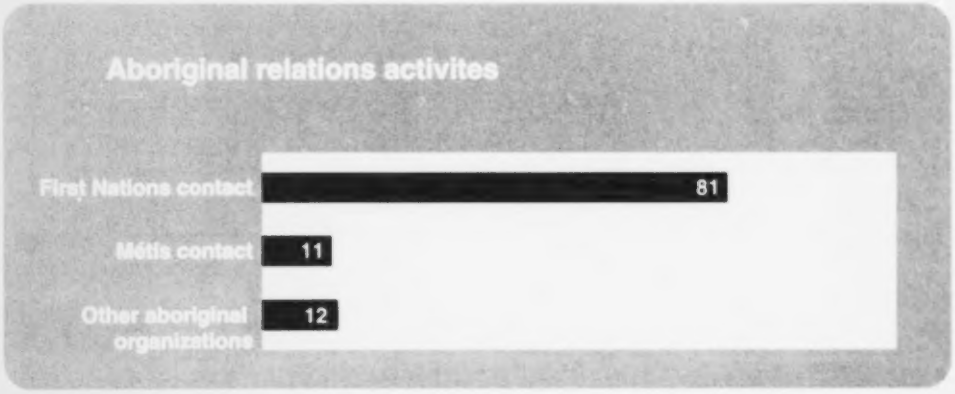


Figure 3.2

The ERCB Aboriginal Relations program has three components: education, awareness, and ERCB core business (responding to issues, concerns, and incidents).

The education component of the program consists of communicating the ERCB's roles and responsibilities to aboriginal communities and other appropriate organizations.

Information is shared regarding the ERCB's structure, function, and how it administers regulations, programs, and services throughout the province.

The ERCB recognizes that there are unique protocols, traditions, and cultural differences that staff must be aware of when developing relationships with aboriginal communities. As part of the internal awareness component, various ERCB staff are educated by local aboriginal people on topics such as aboriginal history, culture, demographics, and current issues. Staff also have had the opportunity to engage in cultural events, such as powwows, sweats, and smudges. This training has had an enormous impact on staff in increasing understanding and awareness of the culture and traditions of aboriginal communities and appreciating the impact history has on current situations.

In 2009, awareness sessions will focus more on aboriginal communities in the northern and southern regions of Alberta. Staff will continue to work with other organizations and stakeholders across the province to provide similar training.

With respect to core business, CAR staff work with other ERCB staff to facilitate communication with aboriginal communities regarding emergency response and other issues.

In 2008, 229 inspections were conducted on First Nations reserves and 96 inspections were conducted on Métis settlements. In addition, 9 complaints and 29 releases were handled on First Nations reserves; 2 complaints and 9 releases were handled on Métis settlements. (See Figures 3.2 and 3.3.)

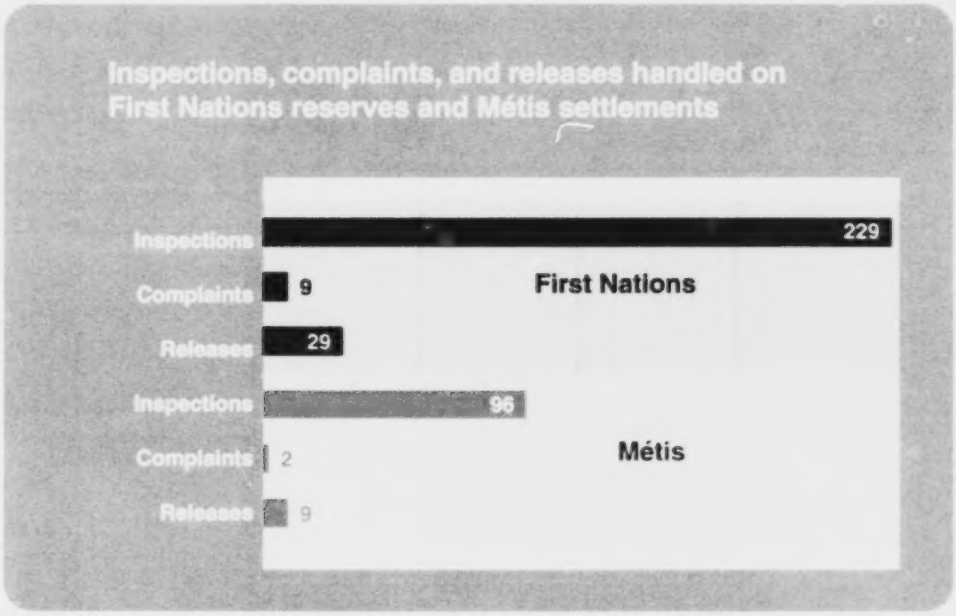


Figure 3.3

The ERCB currently has a communication protocol with Indian Oil and Gas Canada (IOGC) and aboriginal communities with respect to incident response and inspections. In 2009, these protocols will be expanded to include abandonment and closure orders, as well as emergency response plan assessments.

In 2008, CAR staff continued to participate in emergency response exercises on reserves. In order to enhance aboriginal communities' understanding of and involvement in emergency preparedness and response, CAR staff plan to participate in additional exercises throughout 2009.

In 2008, the ERCB continued to support the Circle for Aboriginal Relations (CFAR) Society. CFAR works towards strengthening relationships between aboriginal communities, industry, and government members. Through luncheon meetings and an annual conference, participants share information and best practices and create networking opportunities. For further information on CFAR, visit its Web site at www.cfarsociety.ca.

3.2 Emergency Planning and Assessment

The EPA team is responsible for ensuring that industry meets the requirements set out in *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*. This includes reviewing emergency response plan (ERP) applications, conducting audits and assessments, and tracking and attending industry-held emergency response exercises. EPA also posts frequently asked questions (FAQs) related to *Directive 071* on the ERCB Web site www.ercb.ca.

In April 2008, a revised edition of *Directive 071* was issued, introducing several new requirements. In conjunction with this release, EPA created several new processes which became effective September 2008. These processes increase efficiency when reviewing critical components of ERPs, which gives the team the opportunity to conduct additional emergency response assessments.

The ERP approval process and type of review conducted are now based on a licensee's response to questions on the ERP Application Form, which must be submitted with an ERP. An ERP only proceeds to the review phase if the application is complete. Inaccurate or incomplete ERP applications are closed.

Following approval, an ERP may also be subject to a postapproval audit to ensure that all applicable *Directive 071* requirements have been met. An unsatisfactory audit may result in enforcement action under the provisions of *Directive 019: ERCB Compliance Assurance—Enforcement*, including possible suspension of operations.

To allow time for companies to meet the new requirements, enforcement was not applied on new requirements until July 2008. Temporary exemptions permitting existing plans to remain governed under the 2005 version of *Directive 071* were included in *Bulletin 2008-15* and clarified in *Bulletin 2008-33*, both of which are available on the ERCB Web site. A revised edition of *Directive 071* will be released in 2009, as well as an implementation strategy for existing facilities that met the temporary exemption criteria.

3.2.1 ERP Review and Audit

Since September 2008, four postapproval audits have been conducted in the General ERP Requirement Compliance Category and six postapproval audits conducted in the Technical ERP Requirement Compliance Category. For details please refer to *Directive 019* and the Risk Assessed Noncompliance table. Three supplemental audits based on the 2005 edition of *Directive 071* were also completed. No noncompliances were identified.

Also in 2008, EPA staff reviewed and approved

- 251 drilling and/or completion ERPs,
- 41 production facility plans,
- 75 ERP supplements, and
- 8 high vapour pressure (HVP) plans.

EPA no longer accepts requests for reduced emergency planning zones.

All ERPs must be technically complete prior to receiving approval. In 2008, 33 applications were closed by the EPA group and an additional 10 were withdrawn by the licensee.

From July to December 2008, 27 ERP applications were closed as a result of significant deficiencies in the registration, submission, or application based on the new requirements. Once an ERP application is closed, a licensee must restart the process.

On a regular basis, the EPA team receives local authority setback referral inquiries. This involves local authorities providing a location for subdivision or development and requesting setback information about that location. Staff review and complete a search of ERCB-regulated wells and pipelines in the vicinity of the referred subdivision or development and provide information from ERCB records. A standard reply is provided to parties when there is no activity within the location and no setback. A more detailed reply is provided when there are production facilities that exceed level-1 classification and setbacks are in place. In 2008, staff conducted 4533 setback referrals; 4175 were standard replies and 358 were detailed replies (see Figure 3.4).

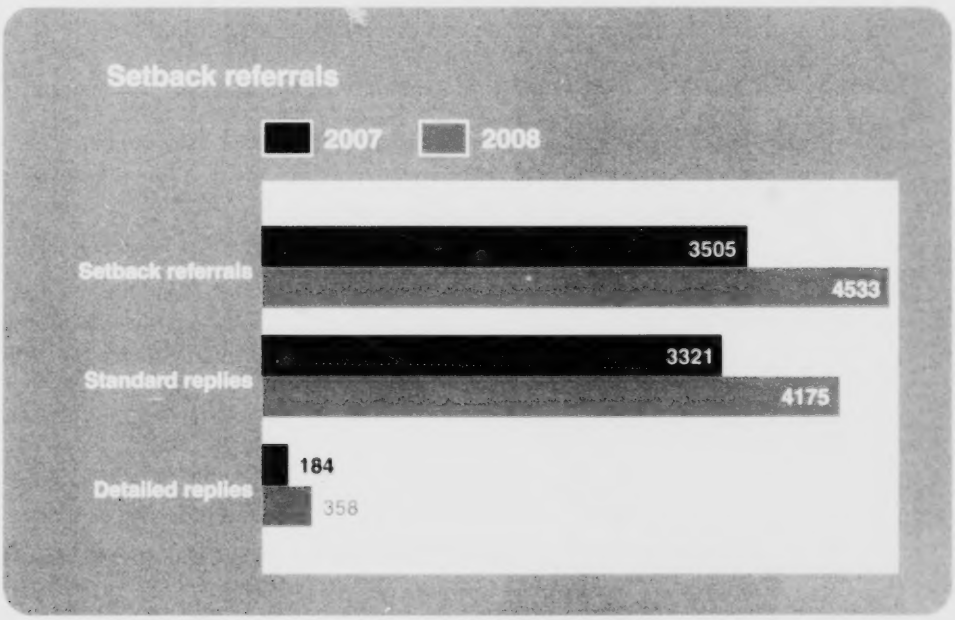


Figure 3.4

3.2.2 ERP Compliance and Enforcement

Staff also track ERP audits and licensee compliance history. Noncompliance events are reported in *ST108: ERCB Monthly Enforcement Action Summary*, which is available on the ERCB Web site.

The ERCB has a comprehensive safeguarding system in place to ensure that a well is not drilled (spudded) without a licence and an approved ERP, if required. Daily checks are conducted to ensure that operations have the necessary approvals. In 2008, three High Risk noncompliances were found for spudding a well without an approved ERP on site. There were no Low Risk enforcements actions issued.

The ERCB publishes new criteria defining persistent noncompliance annually in December. Therefore, persistent noncompliance criteria for *Directive 071* will be applied in 2009.

- Criteria for Low Risk persistent noncompliance are applied annually.
- Persistent High Risk noncompliance is defined as three noncompliance events within the same compliance category within a 90-day rolling window.

3.2.3 Emergency Response Assessment Program

The Emergency Response Assessment program tests a licensee's knowledge of its ERP and, therefore, its emergency preparedness. EPA continues to enhance and expand the assessment program, which involves conducting full and partial assessments.

A full assessment is a comprehensive process that can include an audit of the ERP as well as a review of training records, public and local authority consultation records, field verification of the ERP, and interviews with key responders identified in the ERP. Partial assessments, which were implemented in fall 2008, can test any aspect of an ERP, but often include map verification, review of training, and past exercise documents and telephone verification of 24-hour emergency numbers. The licensee is required to correct any deficiencies identified. EPA tracks and follows up with licensees to ensure that the deficiencies are addressed. During or after the partial assessment process, companies remain eligible for a full assessment.

Since fall 2008, EPA has conducted 16 full assessments and 28 partial assessments. The findings from these assessments were addressed primarily through additional training and exercise. During this time, no enforcement action was issued.

EPA is training new assessors in order to expand the assessment team.

3.2.4 Acid Gas Referrals

In 2008, the EPA team received 53 acid gas scheme referrals from the Resource Applications Group.

Acid gas is any combination of hydrogen sulphide (H_2S) and carbon dioxide (CO_2) and may include trace amounts of hydrocarbons. Acid gas can be used for enhanced oil recovery; however, the majority of referrals are for disposal into depleted reservoirs or zones containing salt water. Once the reservoir has been pressured back to initial formation pressure, the scheme is complete and the injection wells are abandoned.

Injection of acid gas reduces the amounts of CO_2 and sulphur dioxide (SO_2) that would be released to the atmosphere through normal operating practices.

ERP requirements for acid gas injection fall under *Directive 071*. The EPA team ensures that the company proposing the injection scheme has an appropriate approved ERP in place with public protection measures that reflect the nature of the hazard. Injection schemes are not allowed to operate without ERP approval.

3.2.5 Exercises

Directive 071 contains a requirement for tabletop and major ERP exercises to identify response capabilities and areas for improvement. ERCB staff participate in these exercises as either responders or observers. Most exercises are attended by local Field Centre staff due to their role in incident response, while EPA staff usually attend as observers at exercises that occur as a result of

- an ERCB hearing decision,
- findings of an assessment,
- a noncompliance event and the subsequent action plan, or
- an incident investigation.

In 2008, EPA staff attended eight major exercises. Six were a direct result of assessment findings, one was a precursor to an ERP assessment, and the other was the result of an ERCB hearing decision. These exercises increased the companies' knowledge of ERCB emergency response requirements.

3.2.6 Hearings

In 2008, EPA staff prepared for and/or attended 13 hearings. In the future EPA staff will continue to be in attendance or on standby to assist with hearings as needed.

3.2.7 Stakeholder Engagement

EPA staff attended a variety of meetings with stakeholders, including municipalities, oil and gas companies, land developers, and landowners. In 2008, staff

- attended a workshop with a regional planning authority to provide clarity and solicit input on the sour gas setback referral process;
- proactively engaged provincial government agencies and local authorities to increase understanding of the ERCB's public safety management system via presentations, synergy group meetings, and round-table discussions; and
- continue to be involved in local and provincial initiatives, such as working with the Alberta Emergency Management Agency to review the emergency management system in Alberta and local authorities in their role as emergency partners.

3.2.8 EPA Team Initiatives

Ignition Training—EPA was asked to review and provide feedback on Enform's Ignition Training course. This allowed EPA staff to attend the course and experience hands-on ignition training and classroom training.

Rewrite of Directive 064: Requirements and Procedures for Facilities—EPA staff are contributing to the rewrite of *Directive 064* to ensure that ERP requirements are appropriate and reflect the latest edition of *Directive 071*.

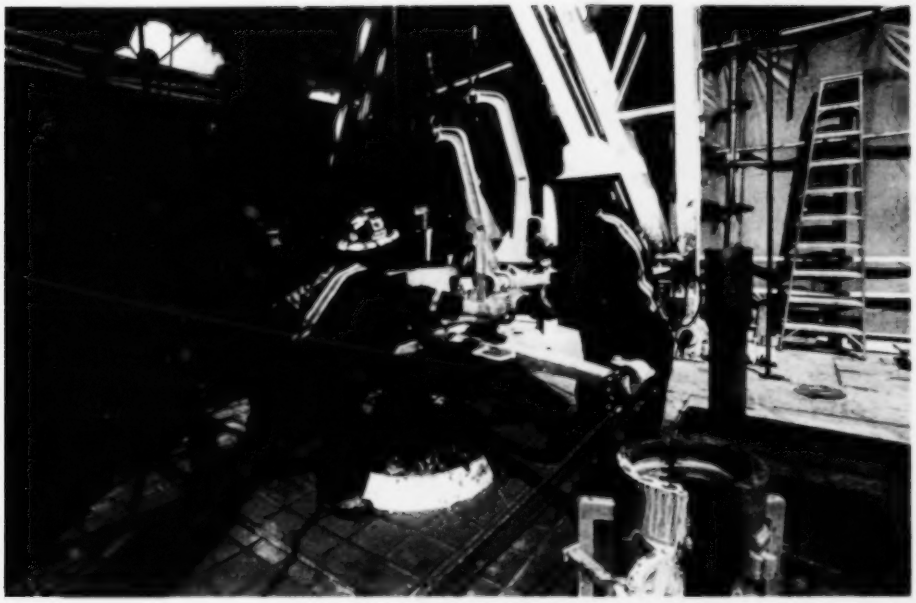
Directive 071 Web page—A Web page devoted to *Directive 071* was created to provide tools, bulletins, announcements, and presentations. It offers information, such as the emergency response matrix, the noncompliance table and FAQs that is easily accessible to all.

3.2.9 EPA Assistance

In 2008, EPA created a help line (403-297-2625) and e-mail inbox (EPAssessment@ercb.ca), providing easy ways for stakeholders to seek clarification of *Directive 071* requirements and processes and to inquire about the status of current ERP applications. Comments and suggestions regarding *Directive 071* can be sent to Directive71@ercb.ca.

An e-mail inbox for setback referrals (SetbackReferrals@ercb.ca) was also created to allow local authorities to forward any setback referrals to the ERCB electronically. This allows for enhanced referral management and improved response time.

4 Drilling and Servicing



The ERCB is responsible for regulating oil and gas drilling and servicing operations to ensure public safety, conservation of resources, and environmental protection. This is accomplished through existing regulations and requirements by conducting compliance inspections, monitoring operator and contractor performance, evaluating incidents, and applying fair and firm enforcement action in cases of noncompliance.

4.1 Activity Levels

Drilling and servicing operations witnessed another decrease in activity in 2008.

Despite this, more than 90 000 wells have been drilled in Alberta since 2004. This has resulted in many challenges for both the ERCB and industry, as both continue to focus on drilling and servicing of wells safely, with minimal impact on the environment and the public.

There were a total of 15 417 wells drilled in 2008, compared to the 16 626 wells drilled in 2007 (see Figure 4.1).

4.2 Well Control Occurrences

Well control data are collected to assist staff in monitoring industry performance. It is also used to identify when changes to regulations, inspection procedures, or operating practices are required.

Kicks,[1] blowouts,[2] and industry's response to these incidents continue to be the primary indicators of industry's drilling, servicing, and operating performance.

[1] Kick—Any unexpected entry of water, gas, oil, or other formation fluid into a wellbore that is under control and

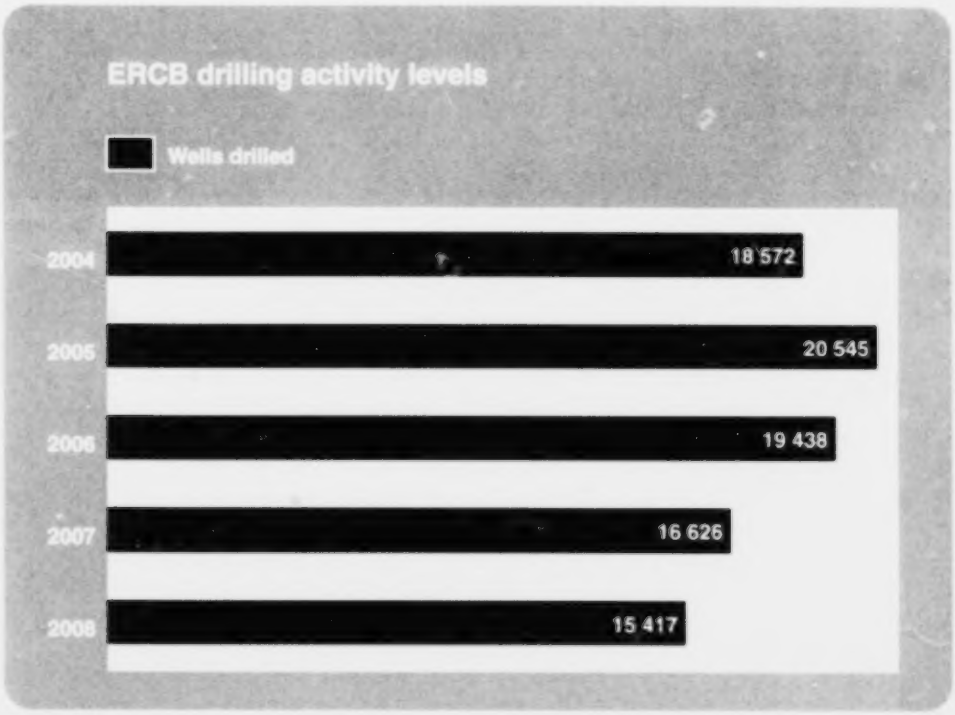


Figure 4.1

Industry's commitment to maintaining high training standards for rig personnel in well control and crew training will help reduce the number of well control occurrences.

Crew training in well control procedures will continue to be a high-priority inspection area for ERCB inspection staff in 2009.

4.2.1 Drilling Blowouts/Kicks

In 2008, 9 blowouts occurred during drilling operations, a decrease compared to 14 in 2007 (see Figure 4.2). This equates to 0.58 blowouts per 1000 wells drilled. Eight of the blowouts occurred during the drilling of surface hole. These 8 were freshwater artesian flows (one well had a sweet gas flow associated with the fresh water flow) and were a result of inadequate well design. The remaining blowout occurred after surface casing was set and blowout preventers installed while tripping pipe out of the well, resulting in an uncontrolled flow through drill pipe at surface.

All blowouts were of relatively short duration (1 to 2 days). There was no significant impact on the public and minimal impact on the environment as a result of these occurrences.

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can be circulated out during drilling operations.

[2] Blowout—An unintended flowing of wellbore fluids (oil, gas, water, or other substance) at surface that cannot be controlled by existing wellhead and/or blowout prevention equipment, or wellbore fluids flowing from one formation to another formation(s) (underground blowout) that cannot be controlled by increasing the fluid density. Control can only be regained by installing additional and/or replacing existing wellhead and/or blowout prevention equipment to allow shut-in or to permit the circulation of control fluids or by drilling a relief well.

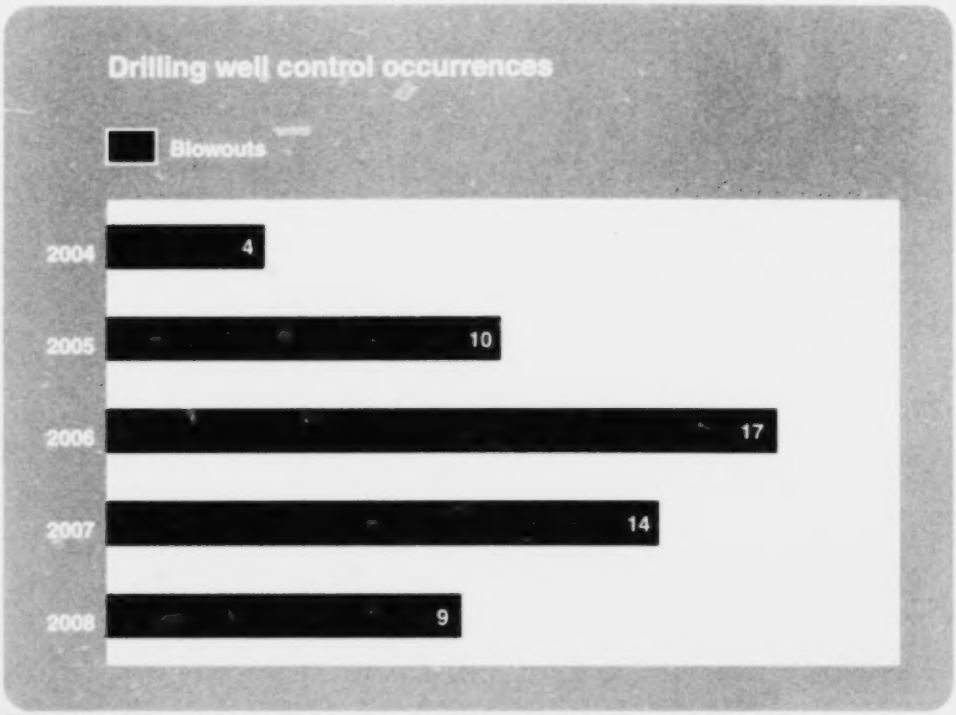


Figure 4.2

There were 52 reported kicks in 2008, which equates to a kick occurrence rate of about 3.4 kicks per 1000 wells drilled. This rate is slightly less than the average kick rate of five kicks per 1000 wells drilled recorded over the last 5 years (see Figure 4.3).

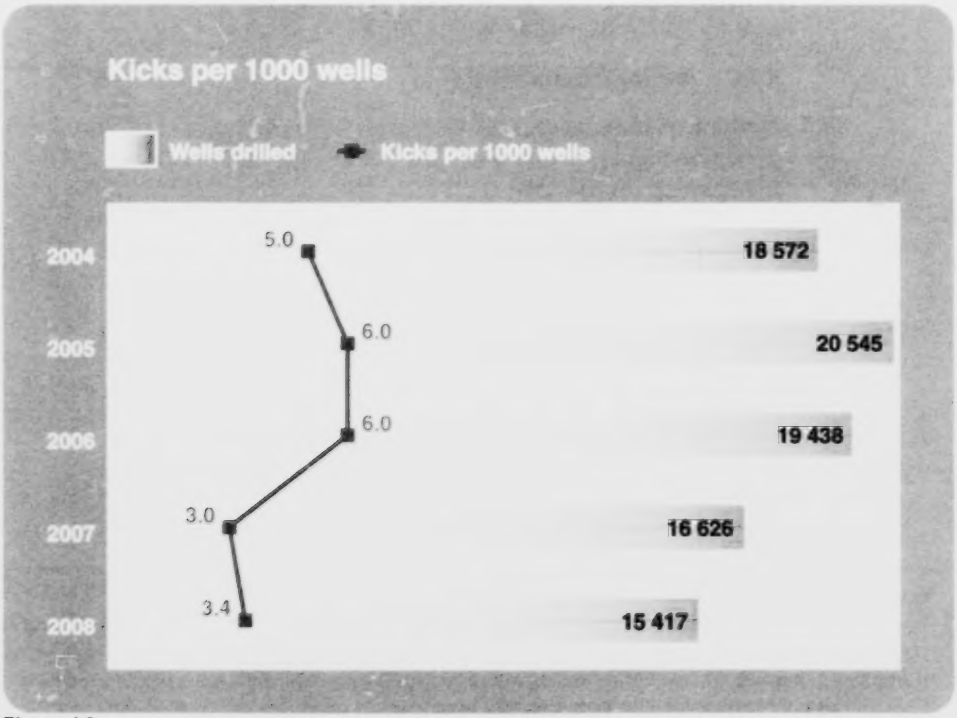


Figure 4.3

4.2.2 Servicing Blowouts

In 2008, there were five blowouts during well servicing operations (see Figure 4.4). All of the blowouts were sweet gas releases. Four of these blowouts were attributed to operator error and one blowout to equipment failure.

All of the blowouts were of short duration (1 day or less), and environmental impact was minimal.

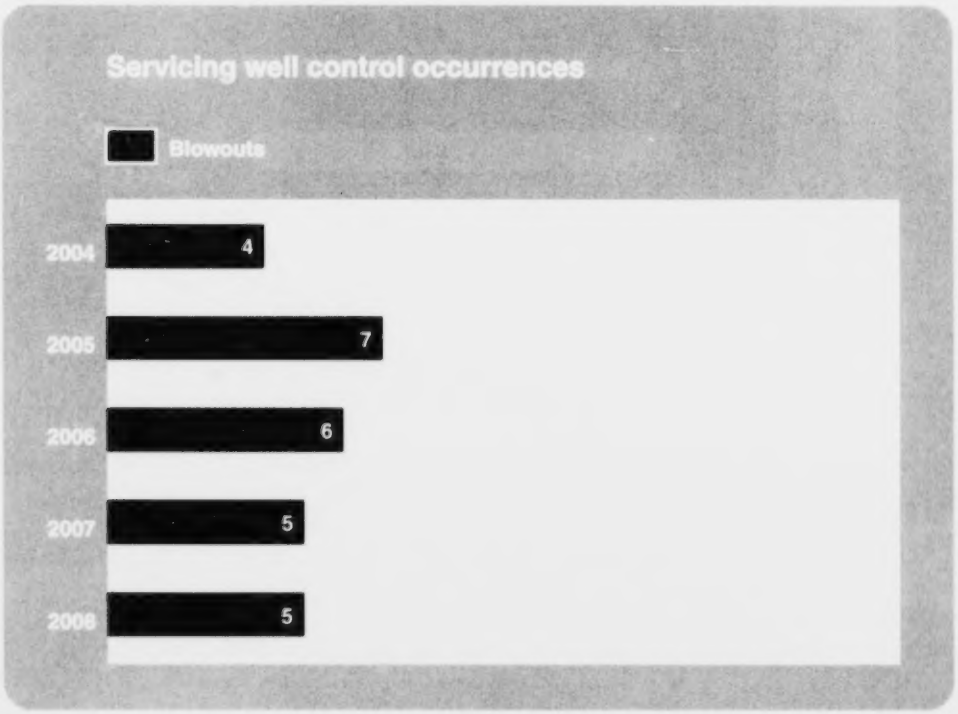


Figure 4.4

4.2.3 Other Blowouts

This category includes blowouts that occur at a well that may be producing, not producing, standing, or suspended. These blowouts are the result of casing failures, wellhead equipment failures, third-party damage (wellhead strikes, vandalism, etc.) or inadequate well design. They are not related to a drilling or servicing operation.

Historically this category accumulates the greatest number of well blowouts. In 2008, 15 blowouts occurred (see Figure 4.5). Of these, 10 were sour (0.01 per cent H_2S—all heavy oil) and 5 were sweet. Four of these blowouts were attributed to third-party damage, with some type of equipment (construction, service, farm, etc.) striking the wellhead. The remaining 11 were the result of casing failures; all occurred in the enhanced heavy oil steam recovery operations in northeast Alberta, resulting in underground releases.

All of these blowouts were of short duration and had minimal impact on the public and the environment.

The ERCB investigates all blowouts to identify when changes are needed to equipment, procedures, or regulations to continually improve industry standards and reduce these occurrences. This will continue in 2009.

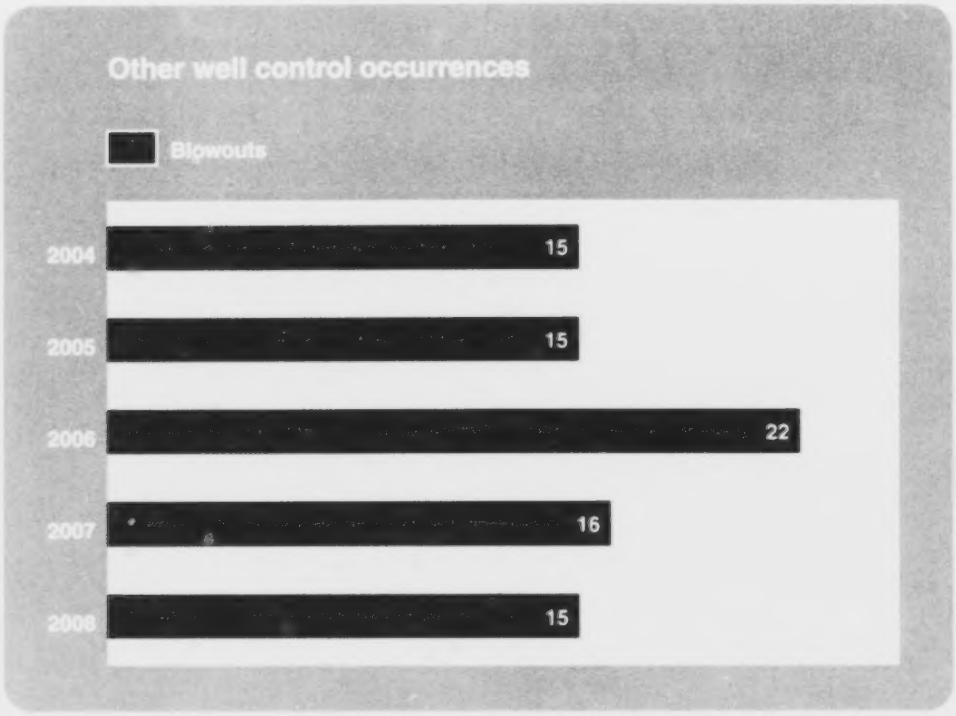


Figure 4.5

4.3 Inspection Results

4.3.1 Drilling Operations

In 2008, staff conducted 357 inspections on drilling operations, which found 296 operations in compliance with ERCB requirements and 61 not in compliance (see Figure 4.6). All noncompliant items were brought into compliance. This compares to 2007, when 389 inspections were conducted, finding 333 operations in compliance and 56 not in compliance.

The ERCB inspects all critical sour wells at least once before drilling into the critical zone occurs. Of the 357 inspections conducted in 2008, 28 were on critical sour well drilling operations. These inspections found 24 operations in compliance with ERCB requirements (85.7 per cent) and 4 not in compliance (14.3 per cent). This compares to the previous year's results, when 49 critical sour well drilling operation inspections were completed, resulting in 39 operations found in compliance (79.6 per cent) and 10 not in compliance (20.4 per cent). Of the 4 operations not in compliance in 2008, 2 were found to be Low Risk noncompliant and 2 High Risk noncompliant.

In 2008, of the 61 drilling operations not in compliance (this includes critical wells, noncritical wells, and investigations), 36 were found to be Low Risk noncompliant and 25 High Risk noncompliant (see Figure 4.7). This compares to 2007, when 56 operations

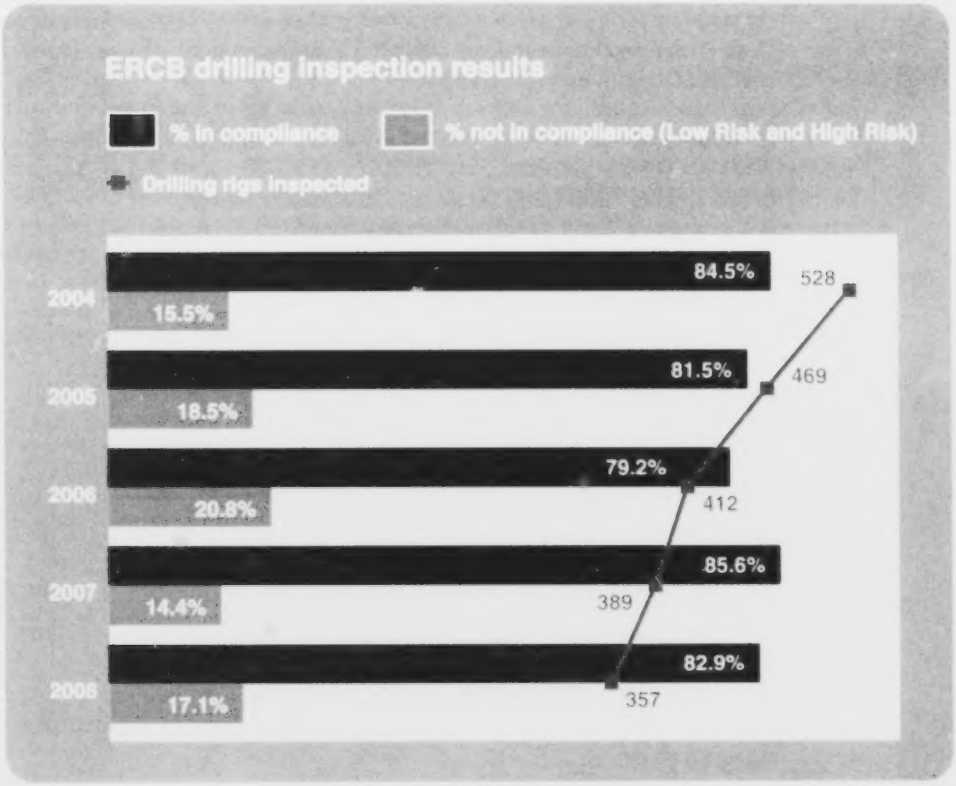


Figure 4.6

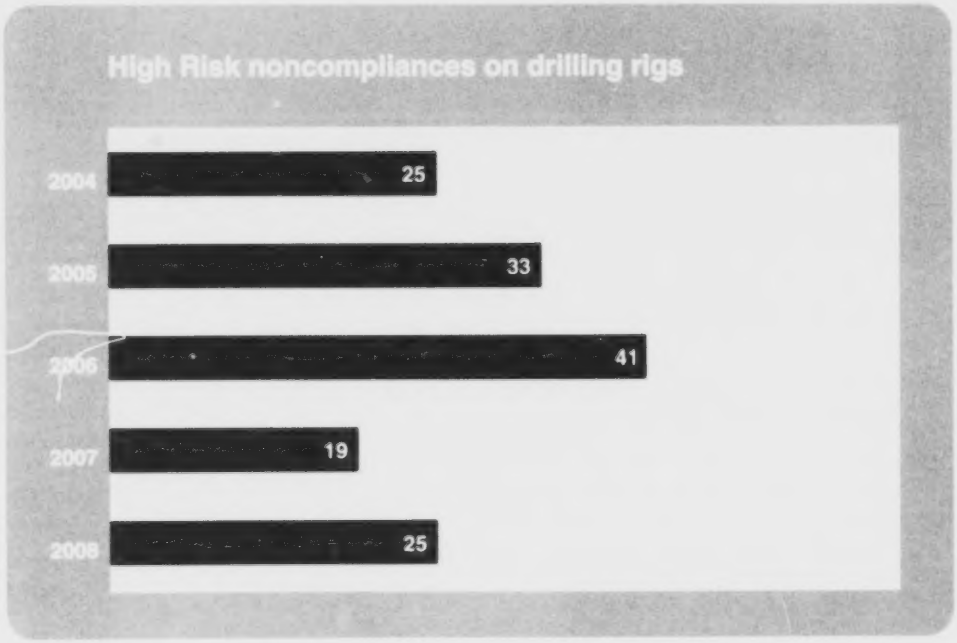


Figure 4.7

were not in compliance, of which 37 were found to be Low Risk noncompliant and 19 High Risk noncompliant. (See Section 2.2 for definitions of compliance and of Low Risk and High Risk noncompliance.)

Drilling operations were suspended at all rigs with High Risk noncompliant items until those items were corrected. The total shutdown time was about 77 hours. This compares to 2007, when drilling rig shutdowns totalled 420 hours.

Figures 4.8 and 4.9 show the most common High Risk and Low Risk noncompliant items in 2008.

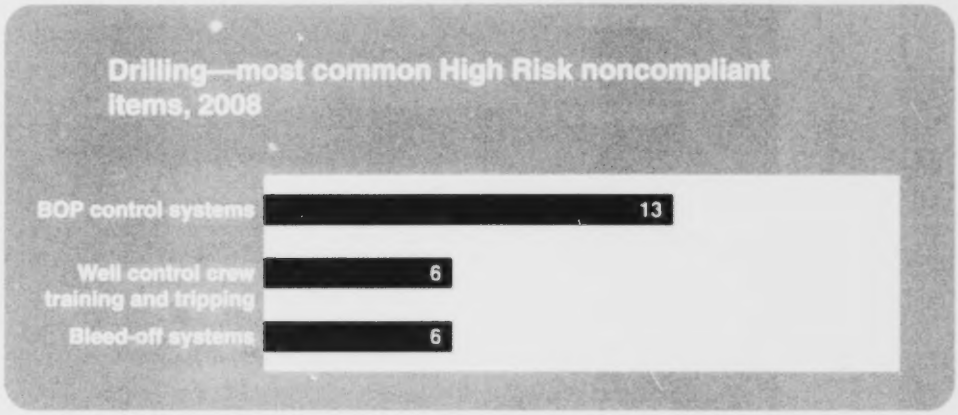


Figure 4.8

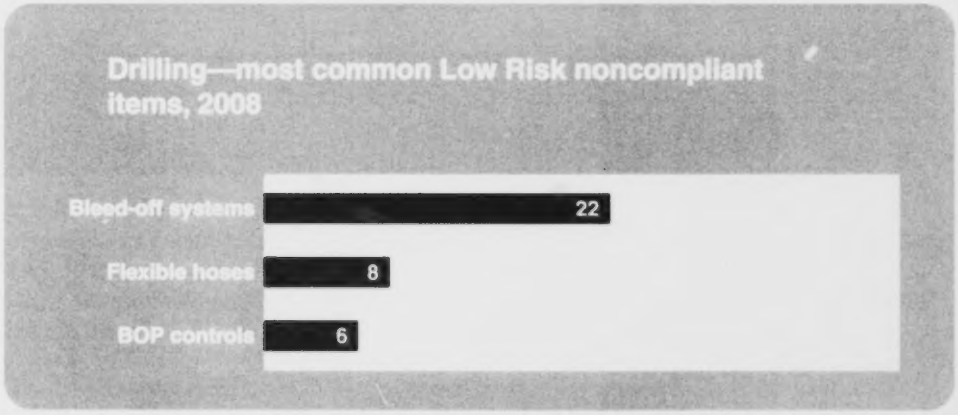


Figure 4.9

In 2009, the ERCB will focus on conducting drilling operator awareness sessions to increase industry's understanding of requirements and improve compliance levels.

4.3.2 Servicing Operations

Well servicing operations also witnessed a decrease in activity in 2008 compared to 2007. This was partly due to the reduction in the number of wells drilled in the province.

In 2008, ERCB staff conducted 288 inspections on well servicing operations, which found 264 operations in compliance and 24 not in compliance (see Figure 4.10). All noncompliant items were brought into compliance.

This compares to 2007, when 256 inspections were conducted, finding 236 operations in compliance and 20 not in compliance.

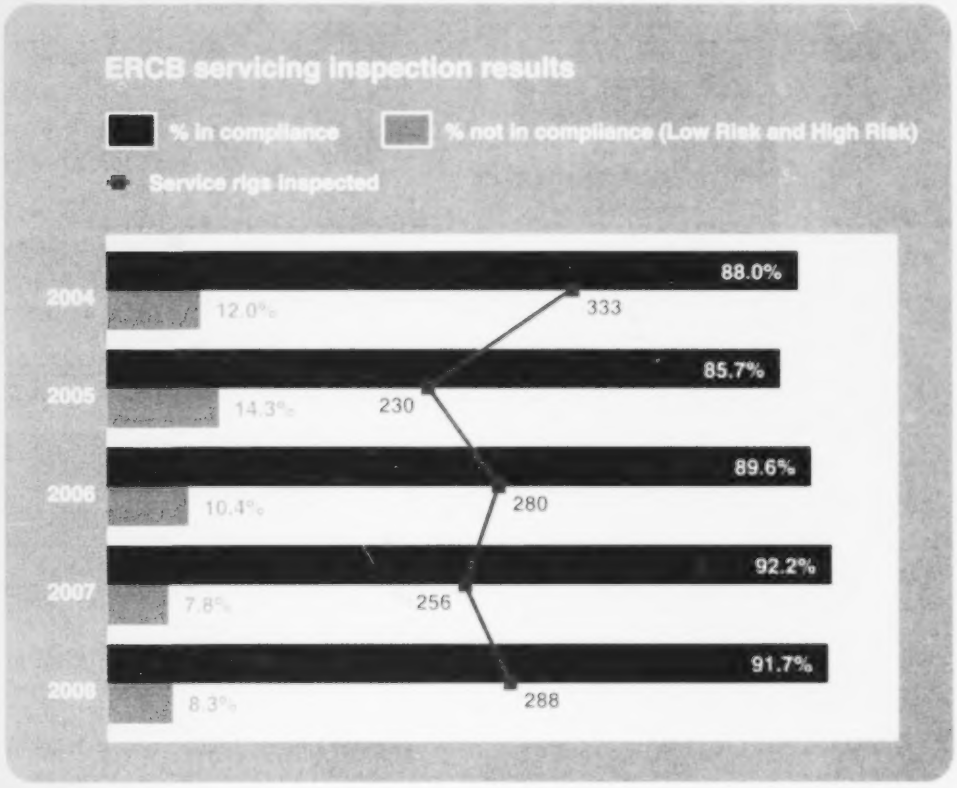


Figure 4.10

In 2008, of the 24 operations not in compliance, 19 were found to be Low Risk noncompliant and 5 High Risk noncompliant (see Figure 4.11). This compares to 2007, when there were 20 operations not in compliance, of which 16 were Low Risk noncompliant and 4 were High Risk noncompliant.

Well servicing operations were suspended at all service rigs with High Risk noncompliances until the noncompliant items were corrected. In 2008, the total shutdown time was about 3 hours. This compares to 2007, when service rig shutdowns totalled 4 hours.

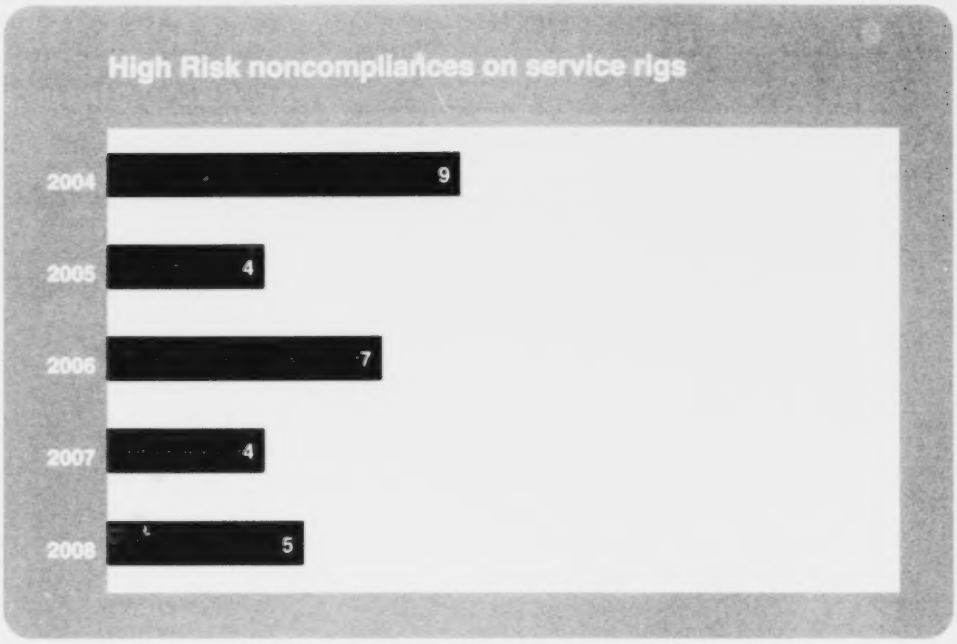


Figure 4.11

Figure 4.12 shows the most common High Risk noncompliant items in 2008.

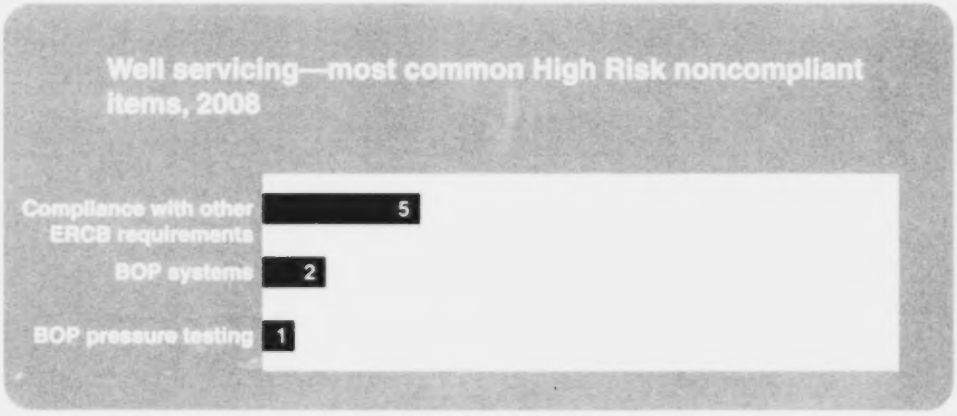


Figure 4.12

Figure 4.13 shows the most common Low Risk noncompliant items in 2008.

In 2009, the ERCB will focus on conducting servicing operator awareness sessions to increase industry's understanding of requirements and improve compliance levels for well servicing.

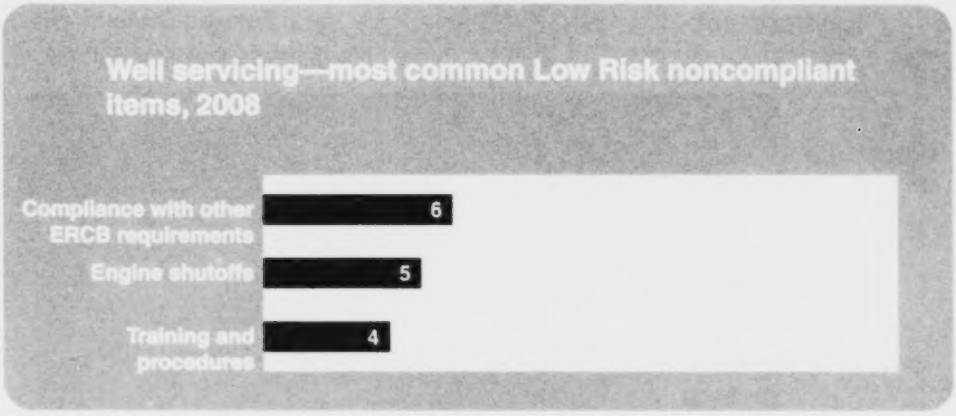


Figure 4.13

4.4 Public Complaints

In 2008, staff investigated 52 public complaints related to the drilling and servicing of wells. Causes of the complaints included such issues as noise, odours, property damage, flaring, and dust created by drilling and service rig operations. This compares to 2007, when 71 public complaints were received about similar issues.

The ERCB will continue to investigate all public complaints related to drilling and servicing operations in Alberta to ensure that appropriate action is taken.

4.5 Drilling and Servicing Team Initiatives

Drilling and servicing inspection staff developed *Directive 072: Well Abandonment Notification Requirements*, which was released in December 2008. This directive requires operators to submit electronic notification to the ERCB prior to any routine or nonroutine cased- or open-hole well abandonment using the Digital Data Submission (DDS) system.

In 2009, staff will conduct inspections on cased- and open-hole abandonments to ensure industry compliance.

In 2009, staff will also begin a thorough review of *Directive 036: Drilling Blowout Prevention Requirements and Procedures* to ensure that it reflects current practices and technological improvements.

5 Environment

The ERCB is responsible for ensuring minimal impact on the public and conservation of the environment when energy development occurs. Inspections are conducted on drilling waste disposal operations, waste management facilities, drilling and servicing rigs, pipelines, and production facilities and on incidents related to spills and releases. Field staff also respond to public complaints and work with industry and other government agencies to minimize environmental impacts.

5.1 Spills and Releases

5.1.1 Spill and Release Statistics and Inspections

Licensees must take the necessary steps to minimize the number of spills and gas releases and their effects on the environment. This includes ensuring that

- their staff are provided with appropriate training,
- the source of a release is stopped,
- the spill is contained,
- all free fluids and solids are recovered, and
- the affected site is remediated in accordance with Alberta Environment (AENV) standards and guidelines.

Releases are prioritized to allow for an appropriate, timely, and effective response by ERCB field staff. The priority of a spill or release is determined by

- whether the spill is on lease or off lease,
- area sensitivity,
- whether the release is sweet or contains H_2S,
- type of area affected,

- environment affected,
- wildlife/livestock affected, and
- public affected.

Priority 1 spills and releases are those that pose the most serious potential environmental and public impact. Field staff make every attempt to immediately respond to the location. However, when that is not possible, all attempts are made to have another regulatory agency respond for the initial assessment. In these cases, ERCB staff conduct an inspection as soon as possible.

Priority 2 spills and releases are those where a significant volume has been released or the impact on the environment is a concern. These sites are generally inspected within seven working days.

Priority 3 spills and releases are low-volume spills contained on site. Generally, about 25 per cent of priority 3 spills are inspected to ensure that they are satisfactorily addressed.

In 2008, 29.1 per cent of priority 3 spills were inspected. The increase in inspections is attributed to all releases being inspected on pipelines, including those of low-volume releases.

Each spill is investigated to determine the cause and to identify any preventive measures that may be required of the licensee to minimize the chances of a recurrence.

As shown in Figure 5.1, 1461 spills were reported to the ERCB in 2008, a decrease from 1508 in 2007. Of the 1461 spills,

- 73 were priority 1 (5.0 per cent),
- 265 were priority 2 (18.1 per cent), and
- 1123 were priority 3 (76.9 per cent).

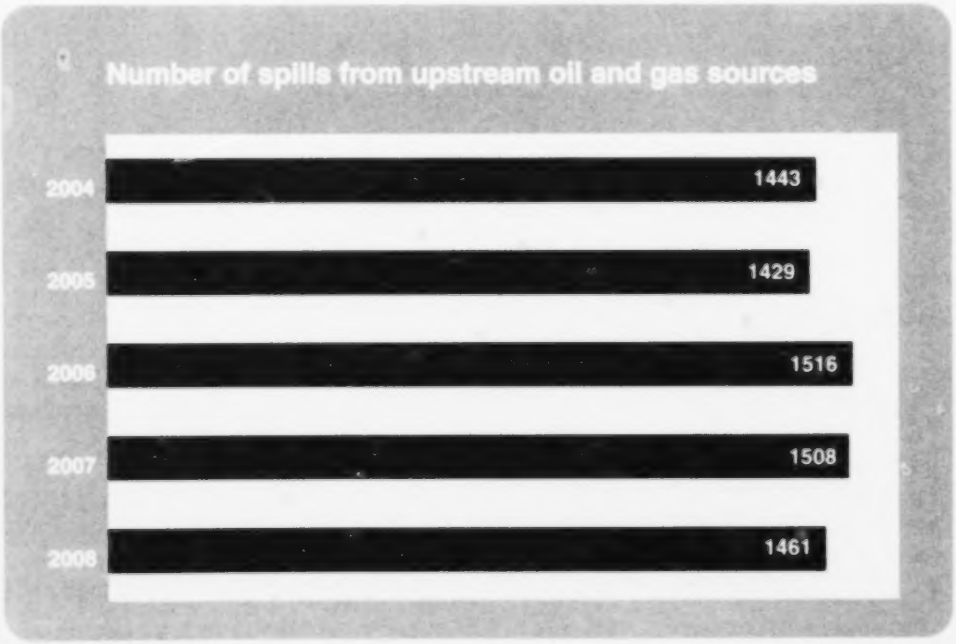


Figure 5.1

In 2008, more than 75 per cent of all spills were low volume and were contained on lease. Inspections were conducted on the cleanup of 847 spills, of which 709 were in compliance with ERCB regulations, 80 had Low Risk noncompliances, and 58 had High Risk noncompliances. (See Section 2.2 for definitions of compliance and of Low Risk and High Risk noncompliances.)

The Low Risk noncompliances were mainly attributed to licensees not notifying the ERCB of a reportable release at the first available opportunity and the estimated volume and impacted area being significantly larger than initially reported.

The High Risk noncompliances were mainly attributed to licensees not immediately notifying the ERCB of a pipeline hit during a ground disturbance or of a pipeline failure and to licensees not storing contaminated soil on a protective liner.

In 2009, staff will continue to meet with licensees to address ground disturbance requirements in an effort to increase their knowledge of ERCB requirements and in turn reduce the number of spills.

5.1.2 Main Causes of Spills

Equipment failure and pipeline corrosion were the leading causes of liquid spills in 2008. This is consistent with previous years. Figure 5.2 shows the most significant sources and causes of spills.

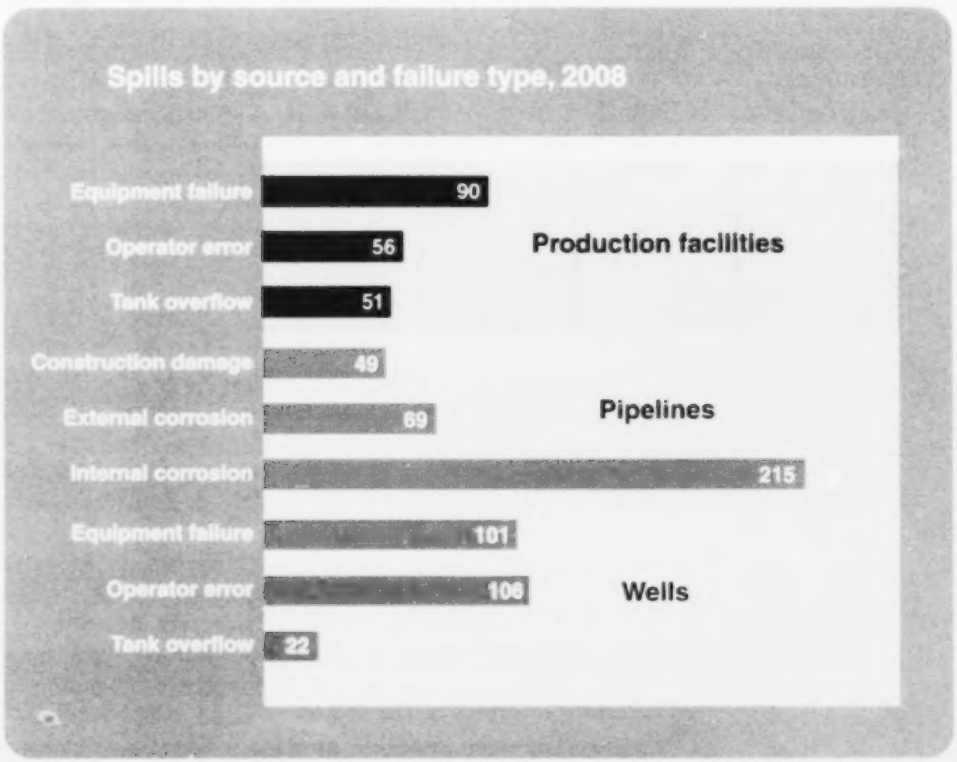


Figure 5.2

In 2008, the spill volumes of produced water and liquid hydrocarbon were 26 211 cubic metres (m^3) and 3927 m^3 respectively. Compared to 2007, produced water spill volumes increased, while liquid hydrocarbon spill volumes decreased slightly. The areas affected and environmental impacts were kept to a minimum. Figure 5.3 shows the volumes of produced water and liquid hydrocarbon spills over a five-year period.

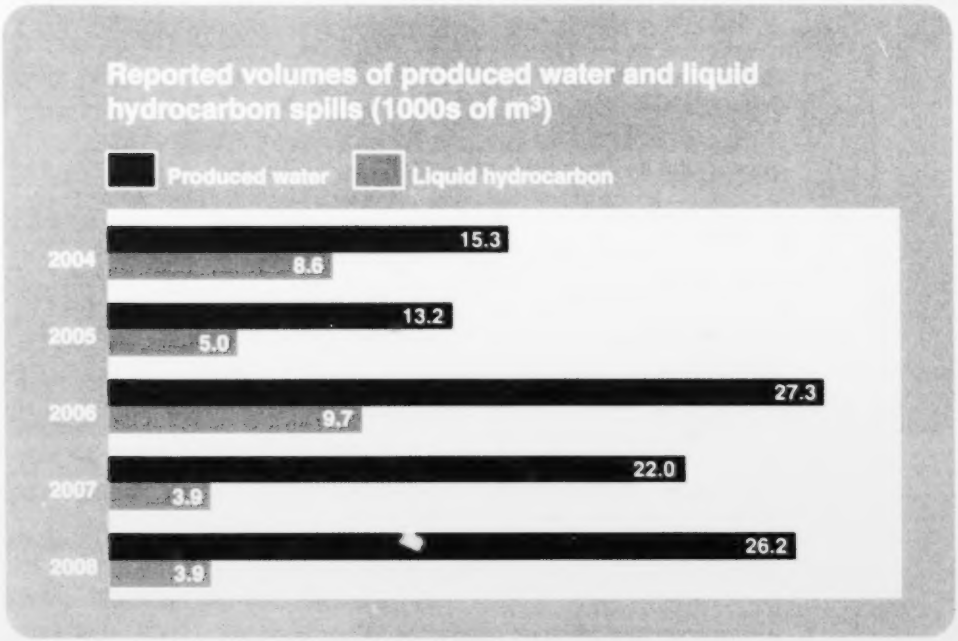


Figure 5.3

In 2009, field staff will continue to work with industry to improve operating practices. This will include a review of corrosion mitigation programs, equipment, and staff training.

5.1.3 Spill Response Training and Prevention

To minimize environmental impacts, licensees must ensure that industry personnel are adequately prepared to respond effectively if a spill occurs.

Spill cooperatives are an excellent way to meet this goal. Alberta has 17 oil spill cooperatives, one of which overlaps into Saskatchewan. Members of a spill cooperative share experiences, recovery techniques, and equipment. They maintain area oil spill contingency plans and have oil spill containment and recovery units (OSCARS) strategically placed throughout the province.

ERCB field staff participate in oil spill cooperative training exercises, which are held at least once a year, and provide industry personnel with information on release statistics, reporting requirements, and regulation changes. The ERCB also works with the Western Canadian Spill Service, Enform, and industry to improve spill response and preparedness prevention programs.

In 2009, the ERCB will concentrate on proactive spill prevention measures at oil spill cooperative meetings and exercises.

5.2 Mobile Ambient Air Quality Monitoring

5.2.1 Monitoring Equipment

There are two mobile ambient air monitoring units (AMUs) at the ERCB. These AMUs have analyzers capable of reading and recording H_2S and SO_2 emissions in the parts per billion range. They also have the ability to measure and record wind speed and direction, which aids in identifying the location and source of an emission.

ERCB technicians have also been working with two newly obtained forward looking infrared (FLIR) cameras. These thermal imaging cameras are primarily used for detecting leaks and fugitive emissions at oil and gas facilities. These tools assist inspection staff in identifying facilities that emit vented gas, such as H_2S, SO_2, and other hydrocarbons.

In 2008, the air monitoring group welcomed a new member, bringing the total to four technicians. Training of the new technician is in the final stages, and the group will be at full complement by March 2009.

The group is anticipating the completion of a new air monitoring unit in early 2009. This unit will use solar panels as a secondary power source to keep the unit operating, which will reduce the group's emissions and carbon footprint. The group is also planning to acquire an additional FLIR camera in 2009.

With the increase in manpower and specialized equipment, the group expects to conduct a greater number of inspections in 2009.

5.2.2 Routine and Complaint Response Monitoring

The air monitoring group conducted 548 inspections in 2008, of which 8 found High Risk noncompliances, resulting in a provincial compliance rate of 98.5 per cent. This was an improvement compared to the 2007 compliance rate of 97.7 per cent. However, the number of inspections decreased compared to the 698 inspections in 2007, due to one air monitoring unit being replaced.

The two FLIR cameras obtained by the group in mid-2008 are capable of visually detecting about 19 different hydrocarbon compounds, including methane, ethane, butane, and benzene. The technicians have been conducting preliminary work with the cameras to aid them in establishing appropriate inspection and operating procedures, which will define minimum requirements for conducting field inspections. Initial usage indicates that the cameras will be a major tool during incident response in finding the sources of leaks at facilities and in the search for emissions from underground sources. Currently, the cameras are being used during detailed gas plant audits to quantify the number of fugitive emission sources from a facility. As testing continues, applications for use will be clearly defined and implemented in 2009.

Figure 5.4 shows historical air monitoring results and industry's compliance record.

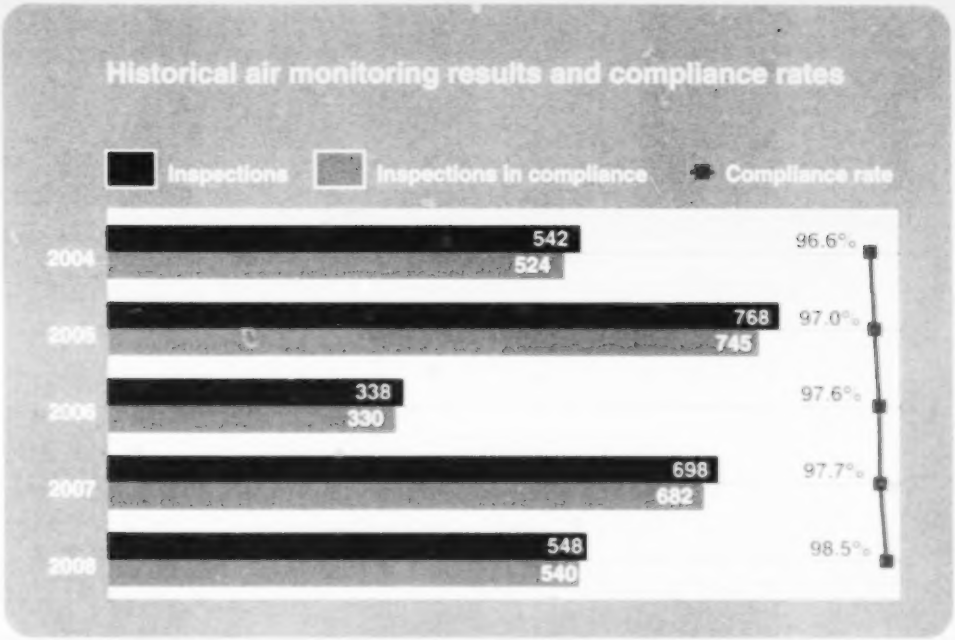


Figure 5.4

5.3 Waste Management Initiatives

5.3.1 Waste Management Facilities

There are 89 operating oilfield waste management facilities approved by the ERCB. Waste management facilities, as described in *Directive 058: Oilfield Waste Management Requirements for the Upstream Petroleum Industry,* include

- waste storage and processing facilities,
- waste transfer stations,
- surface facilities associated with waste disposal wells,
- waste disposal wells (classes 1a and 1b),
- caverns,
- landfills,
- biodegradation facilities, and
- thermal treatment facilities.

In 2008, field staff conducted 90 waste management inspections, including 9 mobile air monitoring inspections. The inspections found 46 waste management facilities in compliance with ERCB regulations, while 38 were Low Risk noncompliant and 6 were High Risk noncompliant (see Figure 5.5).

The most common Low Risk noncompliances included staining/spillage, hydrocarbon odours, and expired meter calibrations. The most common High Risk noncompliances included no secondary containment around tanks, oilfield waste being mixed for the purpose of dilution to avoid regulatory requirements, and not meeting surface pump-off requirements for collected fluids on lease. All facilities were brought into compliance.

Figure 5.5

This compares to 75 waste management facility inspections conducted in 2007, of which 48 were found to be in compliance, 26 were Low Risk noncompliant, and one was High Risk noncompliant.

In 2009, the ERCB will continue to focus on waste management inspections, as well as educating industry about the requirements.

5.3.2 Drilling Waste Management

Drilling waste disposal methods are categorized in *Directive 050: Drilling Waste Management* as being either routine or nonroutine:

- routine—any disposal that does not require preapproval (e.g., mix-bury-cover, landspray, landspray while drilling, and pump-off)
- nonroutine—any disposal that requires preapproval (e.g., land treatment, biodegradation treatments, and alternative disposals)

In 2008, 129 routine and 3 nonroutine drilling waste inspections were conducted. Of those inspections, 117 were found to be in compliance with ERCB requirements, 7 were Low Risk noncompliant, and 8 were High Risk noncompliant.

The most common Low Risk noncompliance items identified in 2008 were

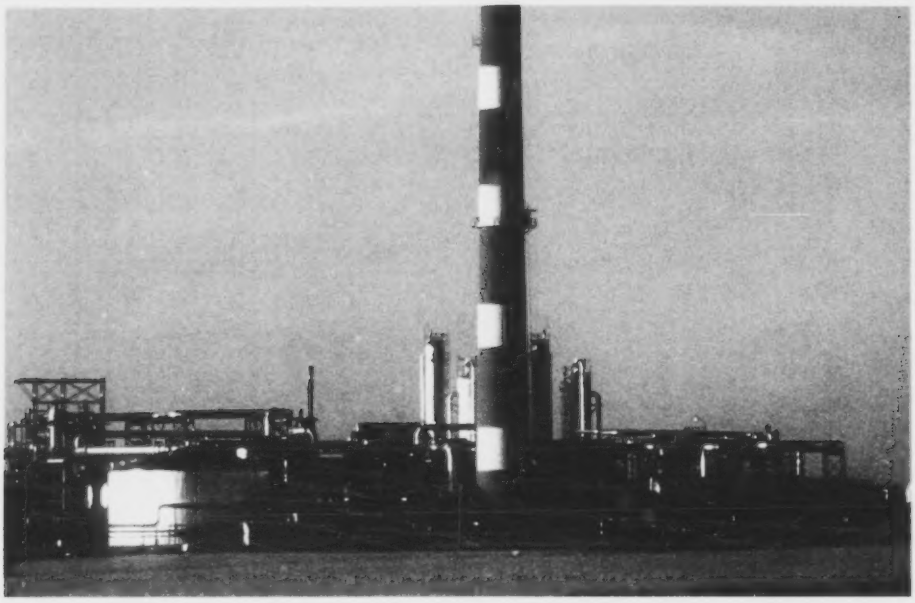
- housekeeping/fencing for remote sumps,
- signage requirements, and
- notification requirements.

The most common High Risk noncompliance items identified in 2008 were

- landspraying closer than allowable limits to surface water,
- inadequate landspraying method, and
- sump not properly constructed

This compares to 2007, when 191 drilling waste inspections were conducted, with 158 found to be compliant, 11 Low Risk noncompliant, and 22 High Risk noncompliant.

6 Gas Facilities



In 2008, staff continued to hold a number of licensee awareness sessions throughout the province. The objective was to inform industry about ERCB requirements and encourage the development of best operating practices to help reduce the impact on the public and environment.

Internally, inspection staff participated in field training sessions with ERCB technical specialists on gas, oil, and the environment. These sessions were conducted at both gas and waste management facilities throughout the province and were good opportunities to provide guidance, increase awareness, and encourage provincial regulatory consistency.

6.1 Inventory, Activity Level, and Inspections

The inventory of licensed gas facilities continues to increase from previous years. As of the end of 2008 it was

- sweet gas single battery 7103
- sour gas single battery 2704
- sweet gas proration effluent battery 4203
- sour gas proration effluent battery 749
- sweet gas test battery 5
- sweet gas plant 541
- sour gas plant acid gas flaring/injection 193
- sour gas plant, fractionation 3
- sweet gas plant, fractionation 6
- gas plant, sulphur recovery 45

- sweet gas plant, straddle 8
- sour gas plant, straddle 1
- sweet compressor stations 3694
- sour compressor stations 919

In 2008, 2 023 gas facility inspections and investigations were conducted. This was a decrease of 33 per cent compared to 2007, when 3 034 inspections and investigations were conducted.

This decrease in inspections and investigations was the result of a combination of factors, including reprioritizing gas inspection time to other inspection disciplines, staff focusing time on project initiatives, and participation of staff in training sessions. All of these efforts will enable the team to be more productive and effective in meeting our inspection goals in 2009.

Of the 2023 gas facility inspections, 1761 were routine surveillance inspections, 163 were air monitoring inspections, 77 were investigations, and 22 were detailed operations inspections.

The percentage of High Risk noncompliances (see Figure 6.1) found in each inspection type was

- detailed operational inspections 22.7%
- investigations 5.2%
- routine surveillance 2.6%
- air monitoring 1.2%

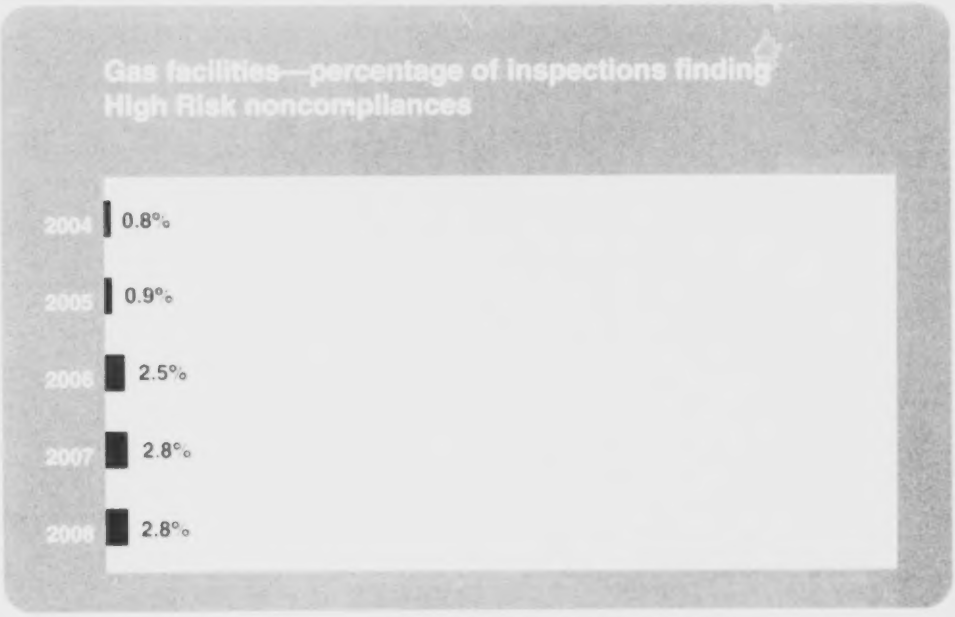


Figure 6.1

Of the 2023 facilities inspected, 64.3 per cent (1300 facilities) were found to be in compliance. Low Risk noncompliances were identified in 32.9 per cent (666 facilities) of the inspections and High Risk noncompliances in 2.8 per cent (57 facilities). All of the reinspections conducted in 2008 found the facilities to be in compliance.

The percentage of inspections finding High Risk noncompliances had been gradually rising since 2004, but the 2008 data indicated no change from 2007. This is due in part to the 72 High Risk noncompliance self-disclosures that were received by the ERCB in 2008. When a licensee discovers a noncompliant issue within an oil and gas operation, it has the option to disclose the information to the ERCB. Action plans are submitted by the licensee, reviewed by the ERCB, and steps are then taken to bring the operations into compliance.

Figure 6.2 shows the most common High Risk noncompliant items in 2008.

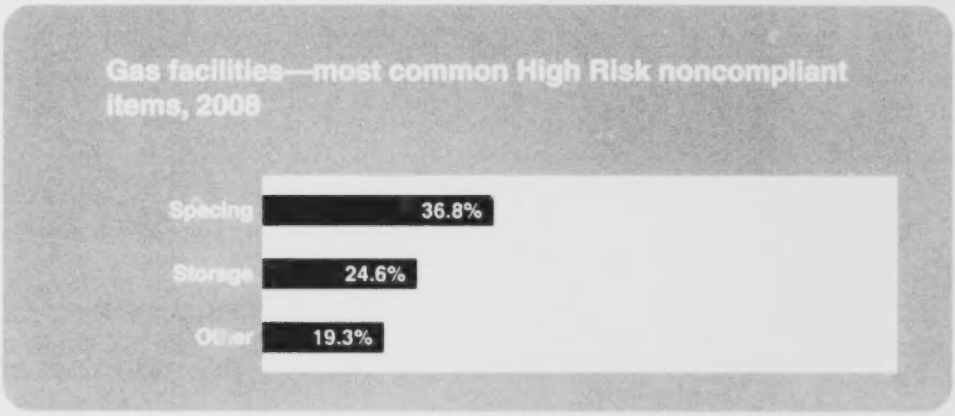


Figure 6.2

Figure 6.3 shows the most common Low Risk noncompliant items in 2008.

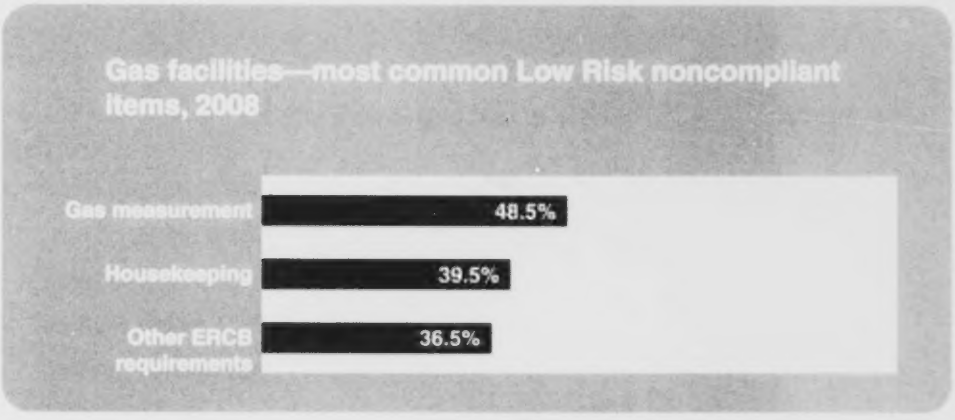


Figure 6.3

6.2 Public Complaints

In 2008, there were 98 public complaints related to gas facilities (see Figure 6.4). All complaints were investigated and appropriate enforcement was applied where required.

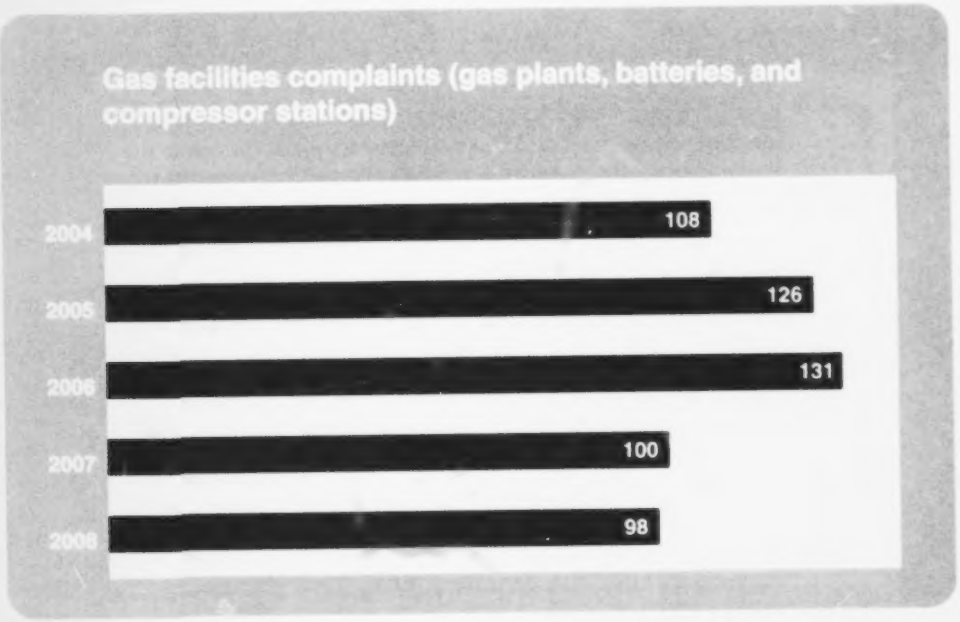


Figure 6.4

Figure 6.5 shows the breakdown of complaints related to gas facilities in 2008.

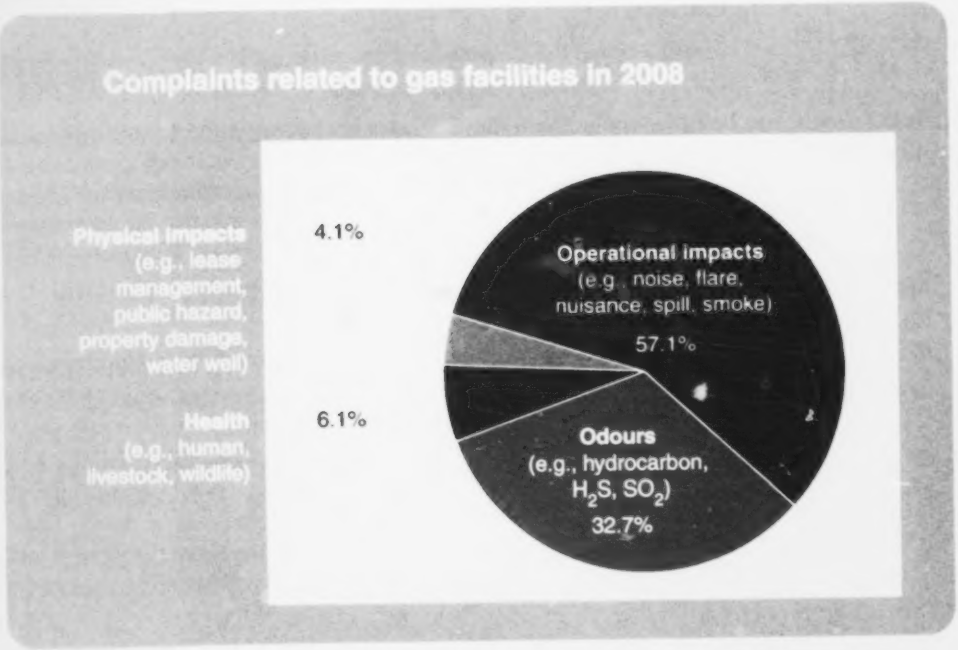

Complaints related to gas facilities in 2008
Physical impacts (e.g., lease management, public hazard, property damage, water well)
4.1%
Operational impacts (e.g., noise, flare, nuisance, spill, smoke)
57.1%
Health (e.g., human, livestock, wildlife)
6.1%
Odours (e.g., hydrocarbon, H_2S, SO_2)
32.7%

Figure 6.5

When a complaint is received, a review of the site's complaint history is conducted. Staff take necessary action to achieve lasting improvement.

Licensees are required to closely monitor operations and are expected to proactively communicate with area residents.

In 2008, staff identified 24 gas facilities as having multiple complaints. These complaints were related to odours, flaring, smoke, and noise. Where necessary, repairs and facility upgrades were made by the licensees to remedy the problems. Facilities that have multiple complaints will be considered for selection when the detailed operational inspections are determined in 2009.

6.3 Licensees with Persistent Low Risk Noncompliances

The ERCB identified two licensees with persistent Low Risk noncompliant items found in more than 50 per cent of the total inspections of their company's facilities in 2007. Each licensee was requested to review its operating practices and develop an action plan for remediation.

The two licensees had a combined total of 62 initial inspections in 2007. Low Risk noncompliant items were found at 46 gas facility inspections, resulting in a 74.2 per cent noncompliance rate.

A review of inspections conducted on these licensees will be initiated to ensure that their compliance rates have improved. If they have not improved, further corrective actions will be taken.

Measures taken by these licensees to improve their compliance rate included

- meeting with staff to gain a better understanding of ERCB requirements and concerns,
- meeting or having training sessions as required with licensee personnel and contract operators to ensure that they are aware of ERCB requirements, and
- implementing internal inspection and audit programs to identify noncompliant items.

Senior ERCB personnel will continue to intervene and meet with licensees that have been identified as persistently noncompliant. This is to identify the root causes and ensure that an approved action plan is implemented to improve compliance.

6.4 Sulphur Recovery

Sulphur recovery efficiencies at gas plants recovering saleable sulphur is at 99.1 per cent. Overall, sulphur emissions have decreased by 49 per cent since 2000, from 78 000 to 39 500 tonnes of sulphur emissions. (See Figure 6.6.)

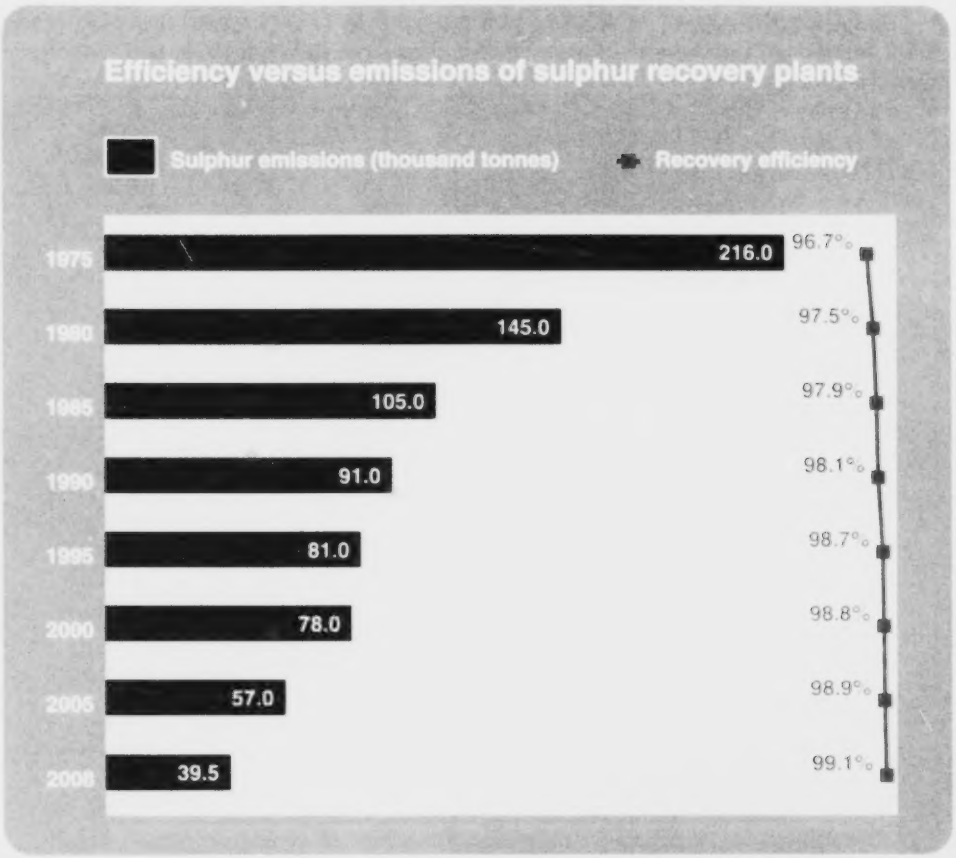


Figure 6.6

6.5 Gas Team Initiatives

In addition to the inspections conducted in 2008, Public Safety/Field Surveillance Branch gas facility inspection staff, with assistance from other ERCB staff, took part in a major project to rewrite *Directive 064: Requirements and Procedures for Facilities*.

The purpose of the rewrite is to

- update new requirements introduced since the previous edition of *Directive 064* was issued,
- capture changes from other ERCB directives to ensure consistency across the ERCB,
- clarify existing requirements to reflect changes in industry and industry technologies, and
- provide straightforward information for ease of use for inspection staff, industry, and the public.

The rewrite has involved a significant amount of time and effort on the part of these inspectors. It should have positive long-term effects once completed.

7 Oil Facilities

Staff conduct inspections at oil facilities to identify noncompliances posing potential hazards that may affect the public or the environment. Staff also spend a significant amount of time conducting licensee awareness sessions throughout the province to increase industry's understanding of ERCB requirements and the consequences for noncompliance. These sessions are designed to encourage the development of best operating practices to help reduce the impact on the public and the environment.

During 2008, sessions were conducted on both an individual and a group licensee basis. This will continue in 2009.

7.1 Inventory, Activity Level, and Inspections

As activity levels change, so does the inventory of conventional oil and crude bitumen facilities. There has been an increase in total oil facility inventory from 2007. As of the end of 2008, the following inventory was recorded:

- sweet multiwell batteries 2 572
- sour multiwell batteries 1 058
- sweet single-well batteries 12 127
- sour single-well batteries 1 834
- sweet satellites 2 315
- sour satellites 2 452
- sweet injection/disposal facilities 838
- sour injection/disposal facilities 81
- sweet custom treating facilities 30
- sour custom treating facilities 2

The total inventory of oil facilities, the number of inspections, and the percentage of inspections that found facilities in compliance are noted in Figure 7.1. (See Section 2.2 for definitions of compliance and of Low Risk and High Risk noncompliances.) Of the 3782 inspections conducted in 2008, 74.3 per cent of the facilities were found to be in compliance. Of the 25.7 per cent of facilities found not in compliance, 24.0 per cent (907 facilities) were found to be Low Risk noncompliant and 1.7 per cent (66 facilities) High Risk noncompliant. In 2007, 3804 inspections were conducted, with 28.0 per cent (1066 facilities) found to be Low Risk noncompliant and 2.3 per cent (87 facilities) High Risk noncompliant.

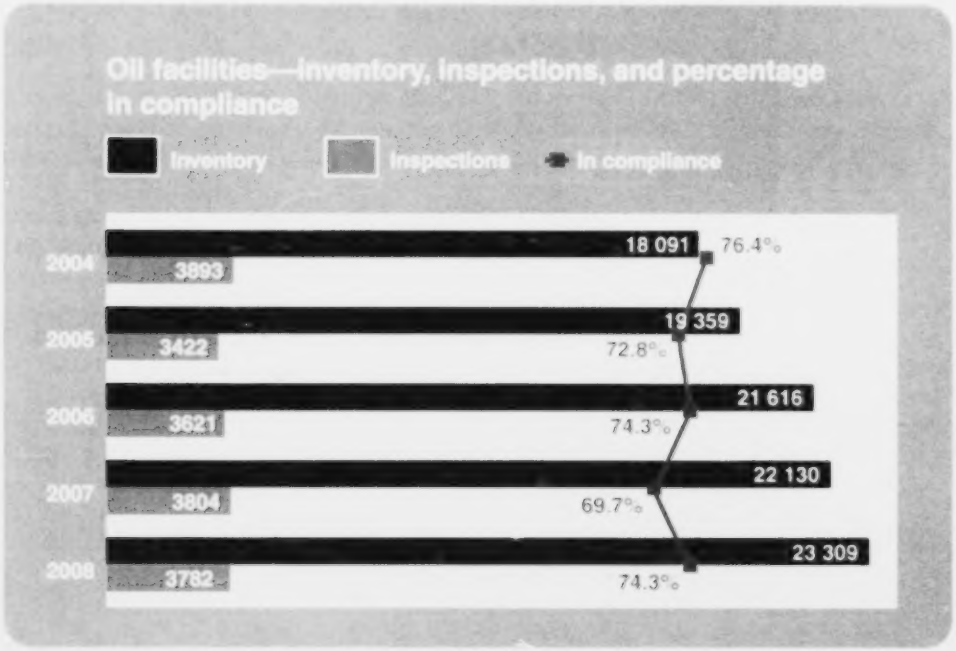


Figure 7.1

Among the 66 facilities found to be High Risk noncompliant, 34 oil production facilities were suspended or partially suspended in 2008 (see Table 2.2). Appropriate enforcement action was taken on all facilities to bring them into compliance.

Figure 7.2 shows the percentage of facility inspections with Low and High Risk noncompliances.

The most common High Risk noncompliant items found in 2008 are shown in Figure 7.3.

The most common Low Risk noncompliant items found in 2008 are shown in Figure 7.4.

All noncompliant items were dealt with in accordance with *Directive 019*.

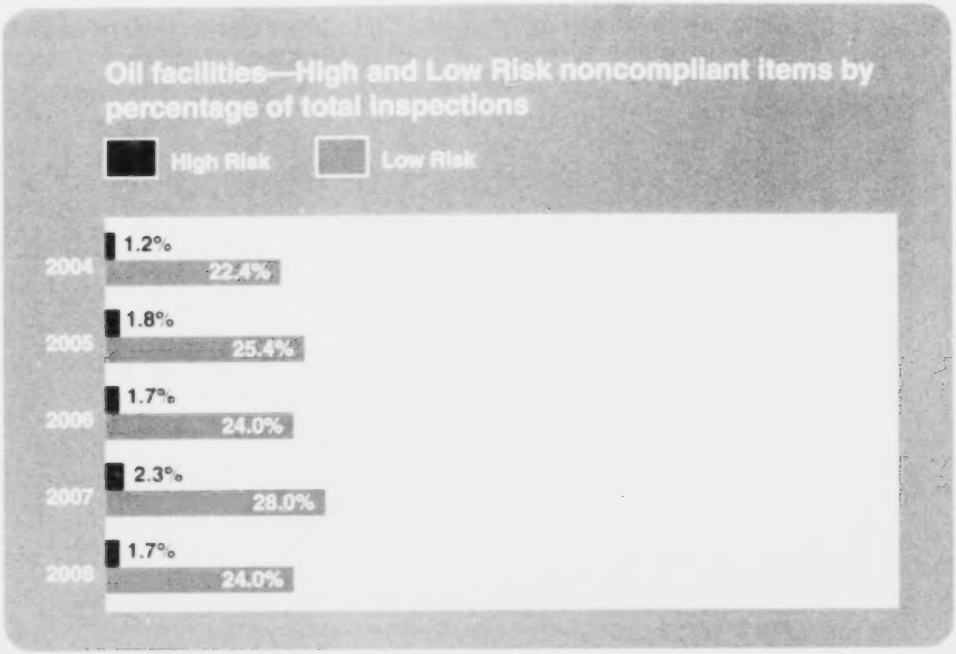


Figure 7.2

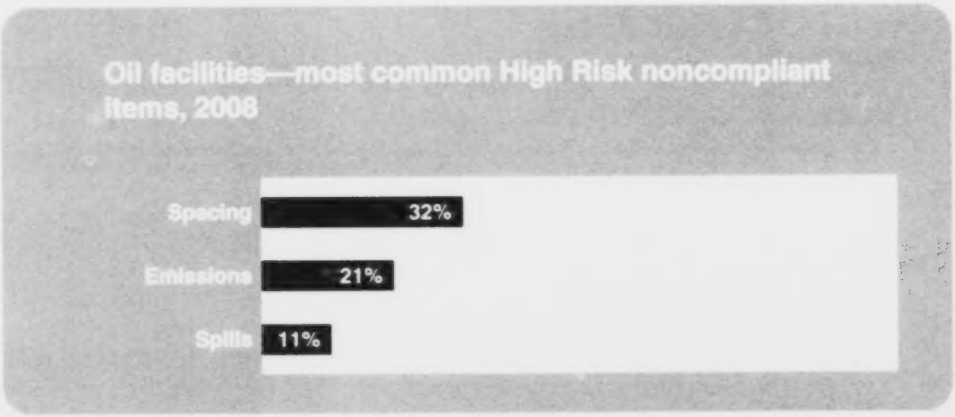


Figure 7.3

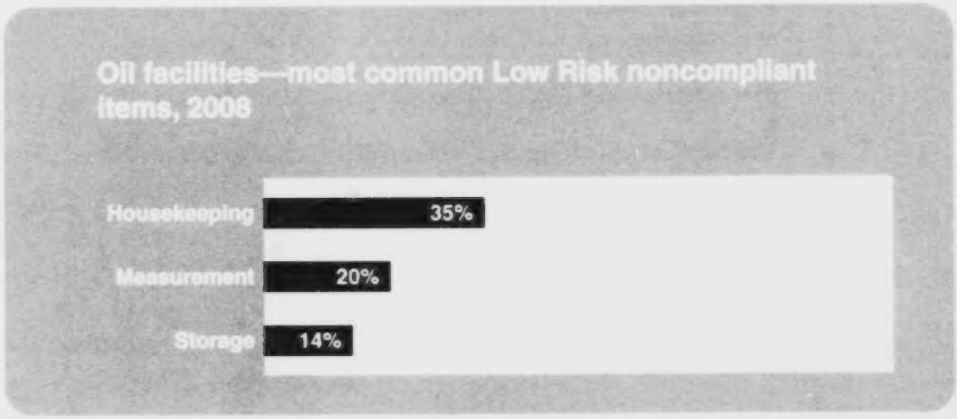


Figure 7.4

The ERCB will continue to meet with licensees to discuss inspection results and focus on finding solutions to improve compliance.

Field staff conduct inspections on sour facilities with site-specific emergency response plans. Staff randomly communicate with residents to share inspection results and ensure awareness of the site-specific emergency response plans.

7.2 Public Complaints

Field centres across the province received 148 public complaints related to oil facilities. Staff investigated all 148 complaints and applied appropriate enforcement where required.

Licensees are expected to investigate all sources of emissions and install equipment or use other technology to reduce emissions. Licensees are also required to closely monitor operations and are expected to proactively communicate with area residents.

When a complaint is received, a review of the complaint history of the oil facility is conducted. If there is a history of public complaints, staff take additional action as necessary to achieve lasting improvement.

In 2008, staff identified 19 oil facilities with multiple complaints against them. These complaints were related to odours, flaring, smoke, and noise. Where necessary, repairs and facility upgrades were made by the licensees to remedy the problems. This compares to 13 oil facilities with multiple complaints in 2007. As shown in Figure 7.5, 50 per cent of the public complaints related to oil facilities in 2008 were due to odours and smoke/flaring.

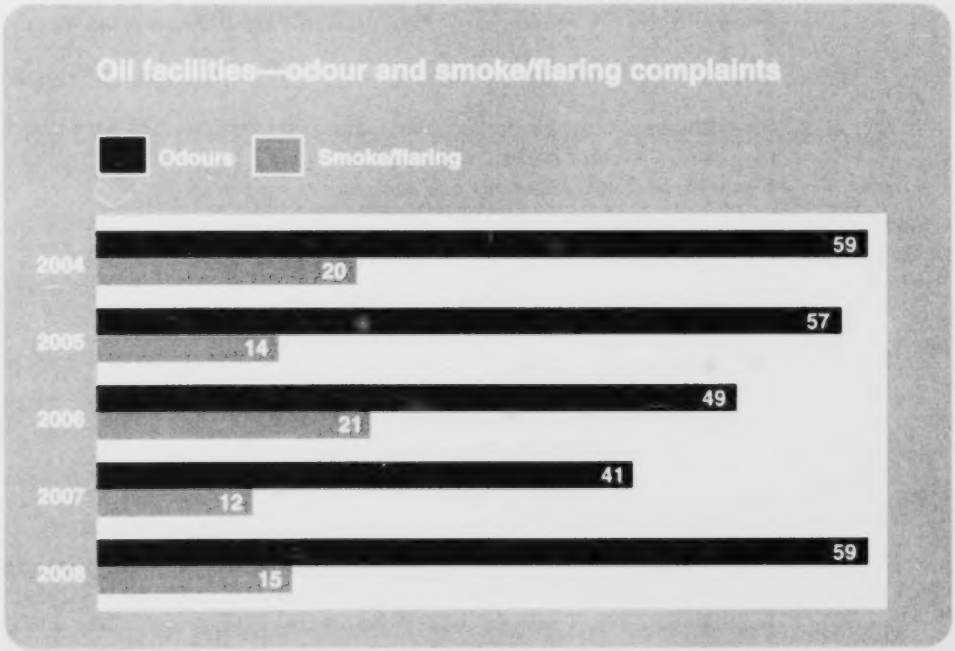


Figure 7.5

7.3 Licensees with Persistent Low Risk Noncompliances

In 2007, one licensee had persistent Low Risk noncompliances in more than 60 per cent of the inspections done at its oil facilities. In 2008, this licensee was requested to review its operating practices and develop an action plan to address the high rate of Low Risk noncompliances.

Measures taken by this licensee to improve its compliance rate included

- meeting with ERCB staff to increase its understanding of requirements and concerns,
- meeting or having training sessions as required with licensee personnel and contract operators to ensure that they are aware of ERCB requirements,
- implementing internal inspection and audit programs to identify noncompliant items, and
- purchasing and implementing preventive maintenance and compliance tracking software.

This licensee made significant improvements in its compliance with ERCB requirements and was subsequently removed from the ERCB persistent noncompliance status category by the end of 2008.

The ERCB identified two licensees that had a high rate of persistent Low Risk noncompliance related to inspections conducted in 2008. Both of these licensees had Low Risk noncompliances found in more than 50 per cent of their companies' total inspections in 2008.

In 2009, the ERCB will work with and monitor these licensees as they develop and implement measures to improve their compliance rating.

7.4 Oil Team Initiatives

In addition to the inspections conducted in 2008, a number of senior oil facility inspectors took part in a major project initiated by the PS/FS Branch involving the rewriting of *Directive 064: Requirements and Procedures for Facilities*.

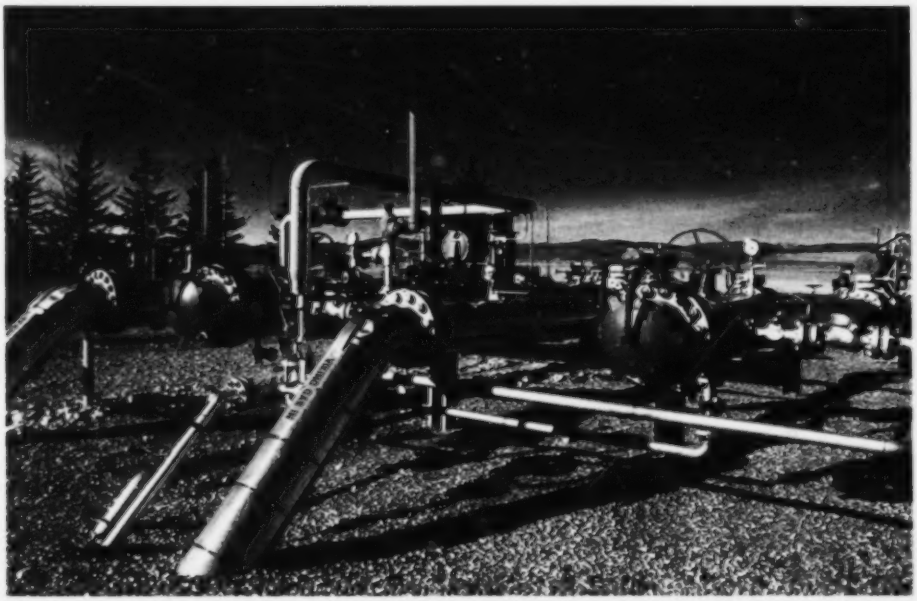
The purpose of the rewrite is to

- update new requirements introduced since the previous edition of *Directive 064* was issued,
- capture changes from other ERCB directives to ensure consistency across the ERCB,
- clarify existing requirements to reflect changes in industry and industry technologies, and
- provide straightforward information for ease of use for inspection staff, industry, and the public.

These inspectors have devoted a significant amount of time and effort to this rewrite, which may have had an effect on the total number of inspections conducted on oil facilities in 2008. However, the revised edition of *Directive 064* will have positive long-term effects once it is completed.

In 2007, oil facility inspectors began increasing inspections of inactive facilities throughout the province, which continued in 2008. This increased level of surveillance of inactive facilities will continue in 2009.

8 Pipeline



ERCB staff conduct inspections to monitor compliance and apply enforcement to address noncompliances. (See Section 2.2 for definitions of compliance and of Low Risk and High Risk noncompliance.) Licensees operating pipelines in Alberta must meet ERCB requirements and industry standards.

8.1 Inspection Areas

Using *Directive 066: Requirements and Procedures for Pipelines*, staff focus on the following key inspection areas:

- **Pipeline failures**—The Alberta *Pipeline Act* requires licensees of pipelines to report all pipeline failures to the ERCB regardless of the cause, magnitude, or consequence. ERCB staff review the cause of the failure to ensure that measures are taken to prevent similar occurrences in the future.
- **Construction and pressure testing**—Staff conduct inspections on new pipeline installations to ensure compliance with the requirements of the *Pipeline Act* and *Regulation* and Canadian Standards Association (CSA) standards.
- **Operations inspections**—Staff conduct inspections on existing pipeline systems to ensure that licensees conduct operational and maintenance activities in accordance with the requirements.
- **Contact damage**—Staff inspect or investigate contact damage occurrences. Awareness seminars are held for licensees and contractors to educate them on requirements that must be met prior to commencing ground disturbance activities. This is done in order to enhance worker and public safety and mitigate environmental impacts.

The length and type of pipelines in Alberta under ERCB jurisdiction are listed in Table 8.1.

Table 8.1. Length of pipelines by type in Alberta under ERCB jurisdiction (km)*

Year	Crude oil	Natural gas	Sour gas	Water	Multiphase	Others	Total
Total prior to 2002	16 171	186 280	17 106	19 117	45 684	25 114	309 472
2002	300	8 064	540	380	962	553	10 799
2003	273	11 715	695	546	1 112	706	15 047
2004	402	13 010	873	845	2 017	882	18 029
2005	116	14 255	880	320	1 221	1 901	18 693
2006	880	15 314	922	545	1 304	1 227	20 192
2007	426	8 075	512	302	1 350	647	11 312
2008	-247**	6 560	343	491	1 157	707	9 011
Total	**18 321**	**263 273**	**21 871**	**22 546**	**54 807**	**31 737**	**412 555**

* Numbers were calculated by adding all statuses (operating, permitted, abandoned, discontinued, and suspended) for all types of pipelines as of December 31 of each year.

** The decrease in the length of crude oil pipelines may be because these lines were never constructed or are being correctly relicensed as multiphase pipelines.

8.2 Pipeline Failures/Hits

A pipeline failure is defined as the failure of the pipeline to contain the substance being transported. For statistical purposes, pipeline hits are included in the pipeline failure numbers.

- **Hit**—striking a buried pipeline during a ground disturbance activity resulting in the pipeline or pipeline coating being damaged; a release of product does not necessarily result.
- **Leak**—an opening, crack, or hole in a pipeline causing some product to be released, but not immediately impairing the operation of the pipeline.
- **Rupture**—the instantaneous tearing or fracturing of the pipeline material, immediately impairing the operation of the pipeline.

The ERCB's release reporting and inspection priority system applies to all pipeline releases (see Section 6.1).

If a pipeline failure/hit occurs, the licensee or operating company is required to inform the local ERCB Field Centre. Field staff record the information in a database, including the date of occurrence, geographic location, pipeline specifications, operating conditions, environmental release information, cause, and priority rating of the release.

In 2008, there were 39 ruptures recorded, an increase compared to the 23 ruptures in 2007. Table 8.2 shows the various causes of failures/hits and corresponding inspections/investigations during 2008.

Figure 8.1 shows the priority ratings for pipeline releases compared to previous years.

Table 8.2. Failures/hits reported from January 1 to December 31, 2008*

Cause	Incidents #	Incidents %	Leaks #	Leaks Inspections/ investigations	Ruptures #	Ruptures Inspections/ investigations
Construction damage	91	9.3	89	89	2	2
Damage by others (hits with release)	27	2.8	9	9	18	18
Damage by others (hits, no release)	82	8.4	0	82	0	0
Earth movement	13	1.3	10	10	3	3
External corrosion	134	13.8	130	130	4	4
Fittings/valve failure	38	4.0	37	37	1	1
Girth weld	15	1.5	15	15	0	0
Installation failure	1	0.1	1	1	0	0
Internal corrosion	385	39.5	384	384	1	1
Joint failure	29	3.0	34	34	1	1
Mechanical damage	8	0.8	7	7	1	1
Mechanical joint	35	3.6	29	29	0	0
Overpressure	21	2.2	19	19	2	2
Pipe body failure	31	3.2	29	29	2	2
Seam failure	9	0.9	9	9	0	0
Weld failure	0	0	0	0	0	0
Licensee error	17	1.7	16	16	1	1
Miscellaneous	25	2.6	22	22	3	3
Unknown	13	1.3	13	13	0	0
TOTAL	974	100	853	935	39	39
% OF INCIDENTS		100	87.6		4.0	

* Statistics include 150 pressure test failures.

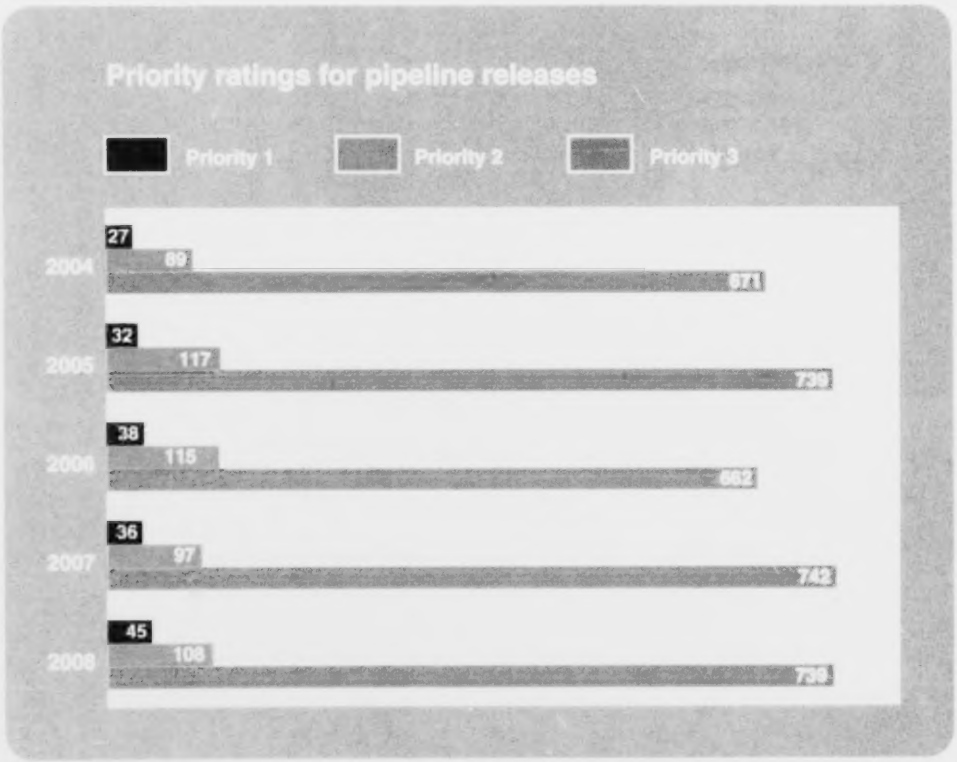


Figure 8.1

Leak detection systems, training and awareness programs, automated shut-in equipment, and pipeline patrols are effective in minimizing the effects of releases.

Table 8.3 summarizes the pipeline releases/hits from January 1 to December 31, 2008.

Table 8.3. Pipeline release/hits, 2008 (%)

Ruptures	4.0	Priority 1 releases	4.5
Leaks	87.6	Priority 2 releases	11.1
Hits, no release	8.4	Priority 3 releases	76.0
	100	No release	8.4
			100

When a failure occurs, the licensee must confirm the integrity of the entire pipeline segment. It must also perform an engineering assessment on the entire pipeline system and outline measures to prevent further occurrences. When the cause of the failure cannot be identified, the licensee is required to perform a failure analysis.

All pipeline failures are inspected or an investigation is conducted into the failure mechanism. In 2008, staff conducted 376 inspections and investigated 598 incidents. The total inspections and investigations include the 109 contact damage incidents that occurred. Inspections found 835 operations in compliance with ERCB requirements, while 47 were found to be Low Risk noncompliant and 92 High Risk noncompliant.

All noncompliant items were dealt with in accordance with *Directive 019*.

Although corrosion continues to be the main cause of pipeline failures, there are fewer internal corrosion failures compared to historical data (see Figure 8.2).

External corrosion remained relatively constant in 2008 compared to historical data. Reducing failure incidents in older pipeline coating systems continues to present challenges, such as the shielding of cathodic protection, disbondment, temperature variation, and environmental stresses.

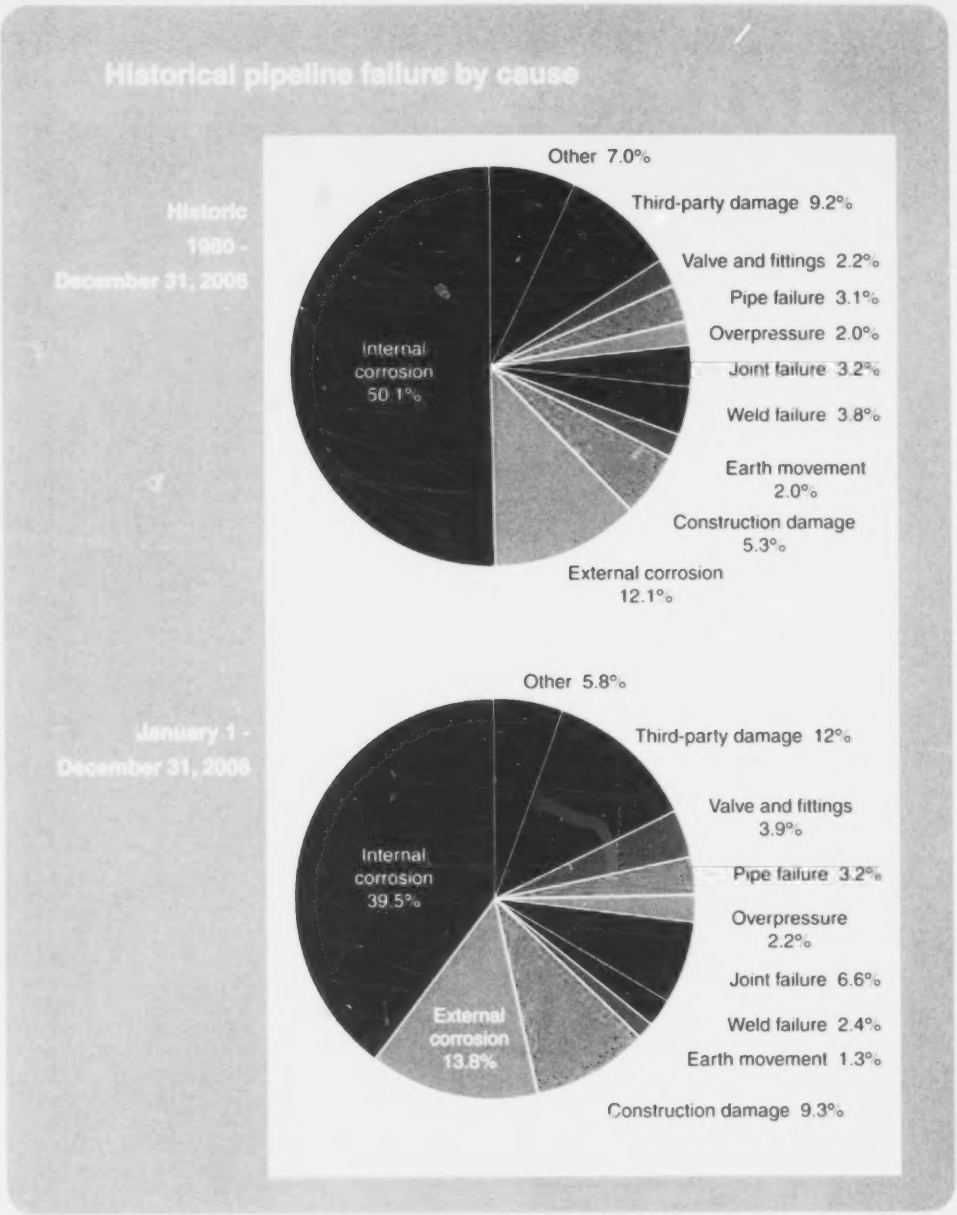


Figure 8.2

Figure 8.3 shows the historical pipeline failures by product. The top three product lines that are failing are multiphase, natural gas, and water.

Historical pipeline failures by product being transported

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Multiphase	329	310	303	308	323	352	330	327	337	350	338
Water	196	162	159	174	193	157	183	179	170	162	202
Natural gas	241	385	420	255	222	232	262	321	317	308	276
Crude	28	31	29	26	14	17	30	19	28	27	15
Sour gas	24	31	35	41	23	29	38	22	33	25	25
All other	4	3	6	4	10	9	4	20	10	8	9

Figure 8.3

Figure 8.4 shows the failures by pipeline size. The majority are occurring in smaller-diameter gathering lines, primarily the 88.9 millimetre (mm), 114.3 mm, and 168.3 mm systems.

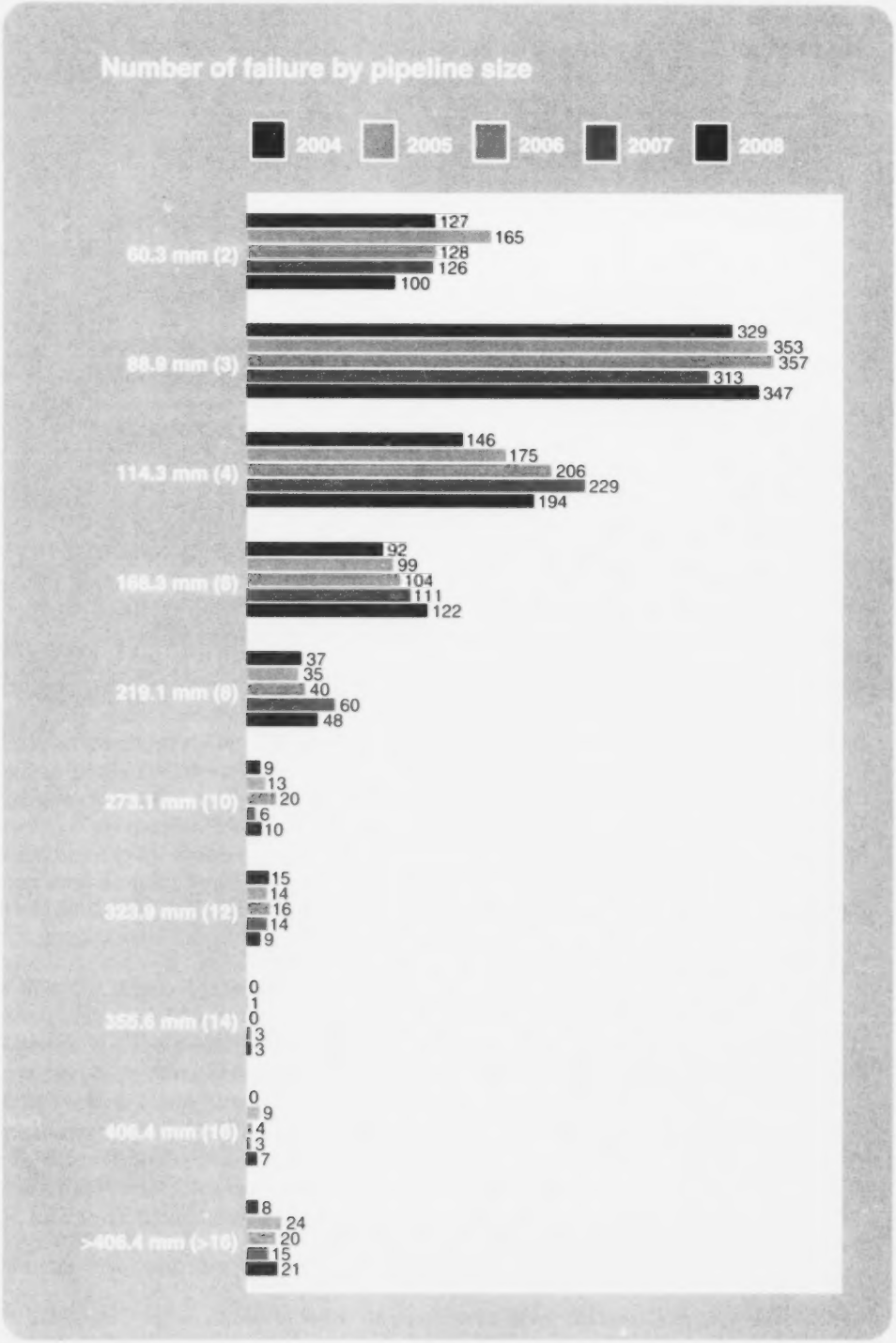


Figure 8.4

Figure 8.5 shows that the pipeline failure rate was 2.1/1000 km, unchanged from 2007. The average pipeline failure rate since 2000 is 2.5/1000 km.

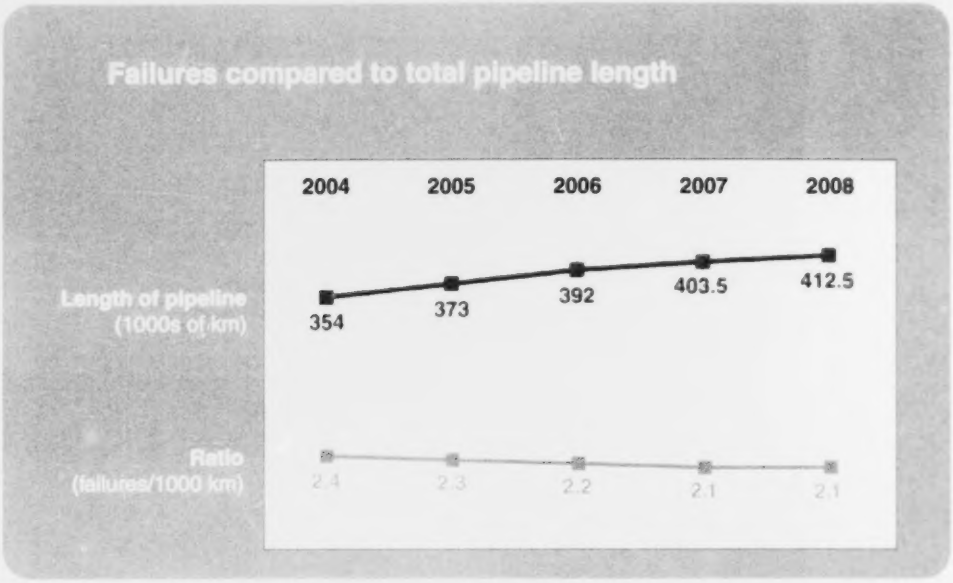


Figure 8.5

8.3 Construction and Pressure Testing Inspections

Field staff conducted 437 pipeline construction and pressure test inspections in 2008, of which 390 were found to be in compliance with ERCB requirements, 34 had Low Risk noncompliant items, and 13 had High Risk noncompliant items. All noncompliant items were brought into compliance. This compares to 443 pipeline construction and pressure test inspections conducted in 2007, of which 393 were found to be in compliance with ERCB requirements, 36 had Low Risk noncompliant items, and 14 had High Risk noncompliant items.

Inspection staff will continue to focus additional inspections on construction in 2009 to educate licensees and identify noncompliant items.

8.4 Operations Inspections

An operations inspection involves a field inspection of the pipeline system and a review of a licensee's maintenance documentation. In 2008, staff conducted operations inspections on 53 licensees, which included the inspection of 200 licensed pipeline systems. The inspections found 102 operations in compliance with ERCB requirements, 45 with Low Risk noncompliant items, and 53 with High Risk noncompliant items. All noncompliant items were brought into compliance. This compares to 58 licensees with a total of 233 licensed pipeline systems inspected in 2007, of which 83 were in compliance with ERCB requirements, 100 had Low Risk noncompliant items, and 50 had High Risk noncompliant items.

8.5 Contact Damage

There were 109 contact damage incidents in 2008 (see Figure 8.6), of which 3 had Low Risk noncompliant items and 29 had High Risk noncompliant items. All noncompliant items were addressed. Following a review, the remaining 77 incidents did not warrant enforcement action. This compares to 116 incidents the previous year, of which 10 had Low Risk noncompliant items and 38 had High Risk noncompliant items.

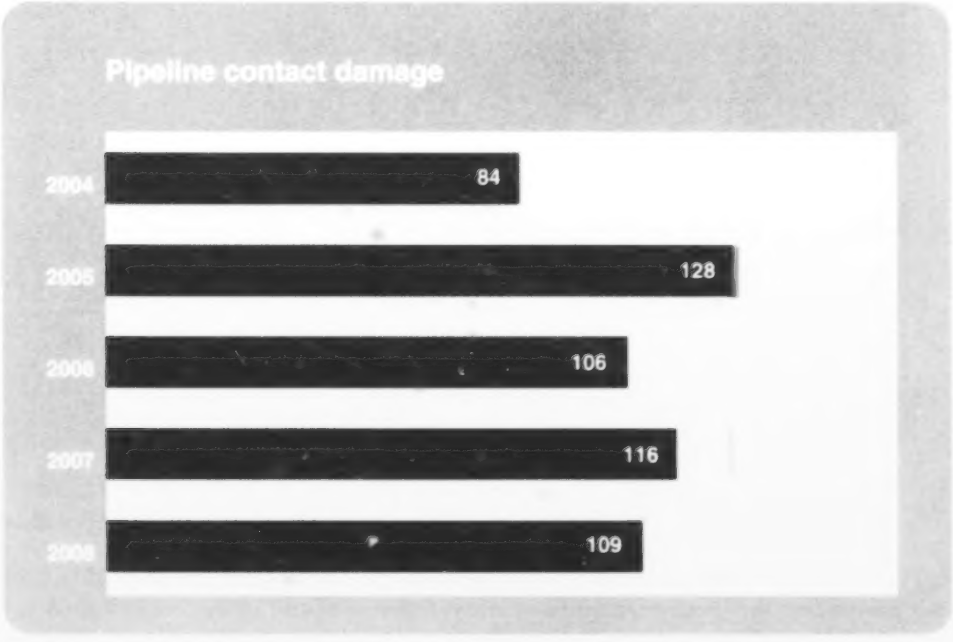


Figure 8.6

In 2008, field staff conducted 15 seminars on ground disturbance for industry and the public. This number has decreased compared to previous years due to the changes introduced to the *Pipeline Regulation* on May 31, 2006.

Field staff will continue to enforce compliance with requirements and monitor statistics for improvement in industry performance.

8.6 Public Complaints Associated with Pipeline Operations

There were 66 complaints associated with pipeline operations in 2008, compared to 72 complaints in 2007. The complaints received were mainly related to odours, spills from pipeline failures, and lease management during construction.

When a complaint is received, a review of the operator's complaint history is conducted. Staff take necessary action to achieve lasting improvement.

Licensees are required to closely monitor operations and are expected to proactively communicate with area residents.

In 2009, staff will continue to focus on pipeline failures, construction, pressure testing, operations inspections, and contact damage.

8.7 Pipeline Team Initiatives

In 2008, inspection staff participated in training sessions with the ERCB pipeline technical specialist. Sessions were conducted in the field on various ERCB-regulated pipeline systems. These training sessions are opportunities to provide guidance and direction, increase awareness of ERCB requirements, and encourage provincial consistency. This will continue in 2009.

Staff will also continue to focus on pipeline failures, construction, pressure testing, operations inspections, and contact damage.

In 2009, the pipeline team will begin a review of pipeline water crossings. This project is expected to identify any shallow depth of cover or integrity issues.

A review of *Directive 066* is currently under way.

9 Major Initiatives

9.1 Field Incident Response Support Team (FIRST)

Within the PS/FS Branch, a team of individuals was brought together and given the responsibility to lead the ERCB in preparing for and responding to significant oil and gas emergency events. This team is known as the Field Incident Response Support Team (FIRST).

FIRST is modelled after other agencies that have similar emergency response responsibilities, most notably the Alberta Environment Support and Emergency Response Team (ASERT). The basic premise is for FIRST to assist the Field Centres in the event of a complex oil and gas emergency. FIRST provides support in the areas of safety, communications, Incident Command System (ICS), air monitoring, and investigation.

Some of the team's goals for 2009 are to

- streamline internal reporting and communication protocols,
- develop better systems to communicate with the ERCB's Government of Alberta emergency response partners,
- enhance working relationships with the ERCB Emergency Planning and Assessment group and field staff so all are aware and involved in a cross-section of industry exercises (a requirement of *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*),
- build relationships with the CAR team to ensure understanding of the issues facing Alberta communities,
- explore external communication protocols to ensure that stakeholders understand the ERCB's approach to emergency response, and

- review *Internal Guide 29: Incident Response and Reporting Protocol Phase 3: Investigation and Reporting Principles and Practice* and the approval process of the Incident Response and Reporting Protocol (IRRP).

These goals will ensure that FIRST meets its objectives of high standards for public safety, environmental protection, and resource conservation.

9.2 Setback Review

In response to a recommendation by the Provincial Advisory Committee on Public Safety and Sour Gas, the PS/FS Branch initiated a study in the spring of 2008 to review its current sour gas setbacks.

The development of a new model, ERCBRISK, is nearing completion. It will be used in combination with the ERCBH2S dispersion model to estimate the risk to the public associated with sour gas facilities and to assess whether the current ERCB setback distances are adequate.

Members of the Provincial Advisory Committee on Public Safety and Sour Gas are being advised on a regular basis regarding the progress of the review.

9.3 Fort McMurray

The Fort McMurray Regional Office (FMRO) has grown significantly over the past few years. There are currently over 40 staff, including a senior inspector who has joint responsibilities to the FMRO and the PS/FS Branch; specifically the Bonnyville Field Centre.

In 2009, PS/FS worked with FMRO to create *Directive 073: Requirements for Inspection and Compliance of Oil Sands Mining and Processing Plant Operations in the Oil Sands Mining Area.*

This directive details ERCB rules and requirements that must be followed by oil sands mining and processing plant operators. It also outlines the expectations of ERCB field inspectors and serves as an updated manual for field staff to follow during inspections.

This new directive combines existing regulations from various directives into one document. It will ensure that operators comply with ERCB regulations.

Staff from PS/FS will continue to work with the FMRO to ensure collaboration and industry's compliance with ERCB requirements.

9.4 Flaring and Venting Review Project

In June 2008, a team of technicians was assembled to conduct flaring and venting assessments on companies operating in Alberta to determine compliance levels with respect to *Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting*, Section 3: Temporary and Well Test Flaring and Incinerating. This team identifies companies that require additional clarification about the requirements and more specifically the Digital Data Submission (DDS) Flaring/Incinerating and Venting Notifications.

A review of the DDS notifications was conducted over four months. The notifications were sorted into four main categories, including late notification to the ERCB, late

notification to the ERCB and the public, H_2S notifications, and notifications regarding larger duration and volumes. The notifications were then reviewed in greater detail for discrepancies, and a full desk inspection was conducted. (Usually staff conduct field inspections but in these cases, they conducted reviews in the office). Companies were also required to supply information to confirm compliance.

A total of 142 companies were assessed and staff examined 3774 DDS notifications. Of those notifications, 416 did not meet the criteria by which they were sorted and were selected for a further review, during which well test investigations were conducted. These found

- 217 in compliance,
- 138 Low Risk noncompliances for late DDS notification to the ERCB, and
- 7 High Risk noncompliances for no or incomplete public notification.

Staff also determined that errors were being made during data entry, including flaring volumes and durations being estimated on the high side. They also found some misinterpretation of *Directive 060* requirements.

The team spent a significant amount of time ensuring that industry was informed of all deficiencies and understood the importance of proper notification. Various presentations were given to many company representatives in Rocky Mountain House, Trochu, and Calgary to reinforce this message.

The review also resulted in the creation of a Flaring/Venting FAQ question and answer sheet to clarify misinterpretations and questions received during the presentations. This document was created in cooperation with the Operations Section and was given out to industry at the presentations.

The team recommended that a regular review be conducted to ensure that facilities are meeting the gas conservation requirements. Currently a process is being created to review these notifications on an ongoing basis in each Field Centre in the province.